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CALIFORNIA RURAL LAND USE
AND
MANAGEMENT

A History of the Use and Occupancy
of Rural Lands in California

By

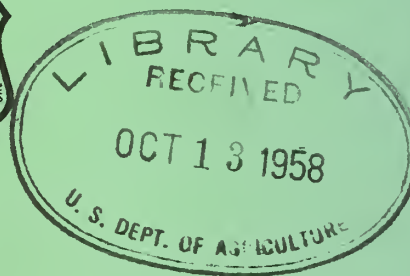
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United States Department of Agriculture
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Chapter XI Challenge to Exploitation and Monopoly, 1906-1920

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CHAPTER XI. CHALLENGE TO EXPLOITATION AND MONOPOLY 1906-1920

Monopolies

During the first decades of the 20th Century, Californians were still very much imbued with the pioneer spirit. This was the same spirit responsible for the building of their commonwealth from a few small pueblos and scattered cattle ranchos to one of the leading States of the nation. This spirit manifested itself in the intense patriotic pride of the better class of citizens who insisted that the principles of democracy, of law and order, be practically applied to keep political skirts clean in a country where Nature herself offered a tempting bait of riches to those who were inclined to consider that exploitation went hand in hand with industrial growth and development.

Certainly something of the spirit of the early-day vigilantes was shown when the people of San Francisco substituted legal processes for the hangman's noose in the political cleanup of their city. It is not with any feeling of pride that Californians look back on the graft and political rotteness which had crept into some of their urban centers about the beginning of the century when civic leaders, branded as thieves, were forced to face their indignant constituents. This condition was brought about perhaps to some extent by the still existent get-rich-quick motives which had actuated many Californians of the earlier era.

While Governor George Pardee was doing his best to spur the State Legislature to more efforts in the conservation of natural resources, the citizens of the leading metropolitan center of the State were discovering that their highest officials were steeped in graft and corruption. Except for mentioning the matter in passing, the story of public prosecution of highly-placed grafters has no place in this history. The case of bribery and theft of public funds brought against Mayor Eugene E. Schmitz, San Francisco's political boss Abe Ruef, and their associates, greatly inflamed the feelings of the local populace. Dynamiting, shooting and incendiarism had marked the progress of the trials through the courts. Out of the welter of graft, however, there emerged a new champion of proper California land use--Hiram W. Johnson--one of the younger prosecutors, sounded a bugle blast against State-wide monopolies and particularly against the dominant railroad interests. The Spanish-American War and the Phillipine Insurrection, the graft prosecution of public officials and the disastrous San Francisco earthquake and fire of 1906, had pushed the machinations of the railroad combines out of the limelight for some time. The strangle hold which the dominating Southern Pacific Company in particular had on California lands was not forgotten.

The Southern Pacific Company was a fair target for the young prosecutor looking for new fields to conquer, and in his race for election to the governor's chair, Hiram Johnson campaigned up and down the State against the Southern Pacific and other trusts and combines, rapidly gaining in wealth and power in California at that time. With its nearly exclusive monopoly of the transportation business in California, the Southern Pacific was by far the wealthiest industrial concern in the State, and was rated as the third wealthiest in the nation. According to one statistician, the assets of this company about that period totaled almost ten billion dollars and a large part of this immense wealth had been drawn from California lands, or was represented by the ownership thereof.

Johnson's training in graft prosecution in the San Francisco episode had given him an insight into the methods by which railroads and other big corporations could, and often did, dominate State politics, and he did not mince words in his campaigning.

While speaking at a crowded opera house one night a large rat, turned loose by some neighboring hoodlums, scampered across the stage and down through the audience. When the shouts of timid women and the rat-catching efforts of the male part of the audience had subsided, Johnson neatly turned the joke by shouting, "There's a great big rat gnawing at the vitals of California, and that rat is the Southern Pacific".

Johnson's anti-trust platform swept him into the governor's chair in 1911, from which vantage point he continued his fight against monopolists and big combines of capital till 1917. Elected that year to the United States Senate, he continued to champion California's cause from his place in the national government.

Contemporary historians agree that railroad dominance of the State's politics ceased with Hiram W. Johnson's election to public office. During his period of service in the gubernatorial chair Johnson was quite appropriately termed the "indefatigable governor", and there was never any letup in his antagonistic attitude towards large combines of capital, rural or industrial. That he enjoyed the confidence of the man on the land is indicated by the heavy vote which he polled as candidate for the national vice-presidency in 1912, and his retention in office as United States Senator until his death.

While governor of California, Johnson's attentions were directed towards other trusts and combines of capital to the creation of which the greatly growing wealth of the State contributed. One such was the Spreckels' interests, which virtually controlled sugar beet farming in California. The

Dingley Tariff Act of 1897, imposing a duty of over seventy-five percent on imported sugar, really meant an annual subsidy of around 140 million dollars to the growing sugar combine. In 1902 Spreckels merged with Eastern competitors, giving birth to the gigantic Sugar Trust. By 1911 this Sugar Trust controlled about 20,000 acres of the choicest sugar beet lands of the State.

That Hiram Johnson's sentiments towards big California combines of capital did not change when he became a part of the national government, is illustrated in his statements made on May 4, 1915. In this particular speech he lashed out at Harry Chandler, who at that time was actively fighting the proposed Boulder Dam project. Johnson said:

"Mr. Chandler, probably the richest man in Southern California, perhaps in all the West, is fighting with all the power of his enormous wealth and influential business connections against the protection, development and safety of the very territory out of which he made his enormous fortune. And in whatever pretext he may indulge, he is in fact doing it for the benefit of Mexico and the injury of Americans and of the country to which he should yield grateful allegiance....

"Here is an instance when men with vast holdings in a neighboring country, all rich beyond the dreams of avarice; who can bequeath to their descendants so much that generations of profligacy could not dissipate it; who, to make a little more money, would enrich the lands in a foreign territory to the impoverishment of their own country; and who, notwithstanding their untold millions, are deaf to the cry of distress and disaster from their own brethren and their own people."

Forest Reserves and National Forests

Meanwhile creation of forest reserves in California was going on apace, the conservationist in the White House chair reaching out as far as the law allowed in the matter - many times on the plea of the people, sometimes in spite of their wishes otherwise.

In 1906, a total of 1,205,395 acres was added, mainly to the Stanislaus and Tahoe Reserves. In 1907 the Inyo Reserve on the east slope of the Sierras was created, making the total additions that year 2,964,806 acres. In 1908 additions to the forest reserves in California embraced 2,306,802 acres. Another forest reserve, the Mono, was created in 1909 from public lands on the east side of the Sierra Nevadas in both California and Nevada, and a grand total of 2,195,366 acres was taken into all the reserves in California that year.

The year of 1910 marked the end of large withdrawals for forest reserve administration in the State when 925,940 acres were added. The Act of March 4, 1907, which provided that forest reserve withdrawals could only be made by Act of Congress in six other far Western States, did not apply to California till 1912. The only withdrawal of any size in California in later years was an area of 350,000 acres added in northern Modoc and Siskiyou Counties in the fall of 1920.

Almost five million acres originally withdrawn for forest reserves in California were eliminated from such withdrawals between 1900 and 1920, mainly large areas of virtually treeless public domain which foresters asserted were not adaptable to the production of commercial timber. The subsequent history of the use of such lands conclusively proved that it would have been much better for the eventual good of the public pocketbook had they been retained under Forest Service administration. However, the widely-scattered, undermanned force of the Forest Service, honestly concerned with their first obligation of public timber and watershed protection, undoubtedly felt that the approximately twenty million acres of California mountain lands--about one-fifth of the State's total land area--already entrusted to their charge, was in itself a sufficiently big job to handle. For over twenty-five years more, large areas of unreserved public domain contiguous to the forest reserves, were without any but the most superficial administration, a "no man's land", or public commons, for citizen or alien alike to use - or abuse.

Range and grazing problems, and not timber troubles, were the first main concern of the infant Forest Service in the State of California. It was quite obvious that the new principle of the use of public land for the "greatest good of the greatest number in the long run" would work a temporary hardship or inconvenience on individuals and small groups. There was no thought in the minds of the Forest Service officials of enforcing the doctrine of eminent domain. The Chief of their department had definitely established the rule that "local questions must be decided on local grounds" and that any change in local use or industry would be handled "on the ground by gradual adjustment after due notice".

The range lands in the new forest reserves were in a deplorable condition and one of the first moves of the foresters was to cut down the livestock grazing to the number of stock which the range might reasonably be expected to support under continuing use. This entailed first the elimination of the tramp stockmen who had neither vested interests in lands dependent upon the forest reserve range, nor established interests by virtue of having used the public range lands preceding their

withdrawal for forest reserve purposes. Since the public lands were the property of all the people of the nation, the words "preference" and "privilege" were early substituted for the term "rights" in connection with the use of forest reserves.

Furthermore, because the butcher, baker and candlestick-maker of metropolitan San Francisco or New York, who had not and perhaps never would see any Western forest reserves but who, nevertheless, were joint owners, fees were established for different classes of uses as the only means of giving these absent owners their share. At the same time, however, there was established in the law special concessions to local residents such as free use of timber for non-commercial purposes, free pasturage for a fair number of work horses or milch cows in current use, and free use of public lands for such works as irrigation structures and other home-building enterprises.

Stockmen of the far Western States had always used range lands free of charge. They had also turned as many livestock on these lands as they pleased and when they pleased, under the code of ethics of "first come, first served", and on the basis that possession was nine points of the law. When the new land administrators assessed pasturage charges against their stock and removed surplus and unpermitted stock from the forest reserve ranges, these stockmen raised a mighty howl of protest in all parts of the West.

The far West was still "wild and wooly" and when the local, unarmed forest rangers, backed by the highest government authority, stood firmly behind their rules that unpermitted or trespass stock would not be allowed on the forest reserves, a good deal of local bitterness resulted.

The more permanent class of stockmen were overjoyed to see the tramp grazer excluded but had no great desire themselves to pay a grazing fee or have government officers tell them when, where or how to graze their stock. The bitter feeling of the time on the Western ranges in general was expressed in a doggerel verse published in the Cheyenne Daily Leader of June 7, 1907, when some unknown range poet chanted:

Bury me not on the range
Where the taxed cattle are roaming
And the angry coyotes yelp and bark
And the wind in the pines is moaning.
On the Reserve please bury me not
For I never would then be free;
A forest ranger would dig me up
That he might collect his fee.

Leaders among the stockmen called a convention of protest to meet in Denver on June, 1907. President Roosevelt met the protest of the massed stockmen in a fighting spirit. He took a firm stand against further monopolization of public lands by large interests, and against any unregulated use of the forest reserves. Unable to be present at the meeting in person, he sent as his personal representatives James R. Garfield, Secretary of the Interior, and Gifford Pinchot, Chief of the Forest Service. His written message to the assemblage, transmitted through these officials, once more asserted that the government would continue to favor "a home-building policy, and the conservation of both water and timber".

In fairness to the protesting stockmen, following this mass convention the President sent high-ranking government officials to all sections of the West to thoroughly investigate any cause for complaint against the administration of the new forest reserves. Conservation of natural resources had become a major issue in the State and Nation, and a short time after the protest meeting at Denver we find Vice-President Charles W. Fairbanks telling the Irrigation Congress in session at Sacramento: "We now see that some of the older countries in their experience have found it necessary to adhere to a national scientific forestry system", and Senator G. C. Perkins of California, addressing the same body stating, "The strongest ally of irrigation is the forest; without our forests there would be no irrigation".

Roosevelt consistently hammered at the need of conservation of the natural resources of the country. He appointed several commissions to work on the matter with a view to bringing about such economic adjustments as were necessary. One of his acts which probably had a far-reaching effect in a general awakening was his calling of a meeting of the governors of the far Western states for a three-day conference at the White House in May 1908. As a result of this White House conference, a detailed public report was made of the use and abuse of our natural resources. The report also made recommendations for the creation of a national agency to correlate Federal, State and municipal conservation efforts.

Mountain Men

Commanding the eye of visitors to the State Capitol at Sacramento is a scroll emblazoned "Bring me men to match my mountains". These words might well be used to apply, not only to the rangers of the Forest Service, but to those of the later-organized United States Park Service, the officers of the State Fish and Game Commission, and of other Federal or State agencies concerned with the administration of the use of publicly-owned mountain lands of California. Something of the greatness of

the mountains seemed to enter the souls of these men, permeating their beings with an intense desire to each become a personal crusader for proper use of this vast people's domain. Certainly the early-day rangers of the federal Forest Service were pioneers preaching in the wilderness the new gospel of conservation to users of land mainly concerned with the immediate profits which could be wrung therefrom. It is a fact which can be easily substantiated, that few of these pioneer rangers ever reached man's allotted age of three-score and ten, mainly because of the toll exacted by the arduous duties of their more youthful days.

In the early years of the Forest Service, reorganized as a Bureau of the Department of Agriculture, six districts were created, each comprising all of the forest reserves in one or more states. California became District Five, with a small volume of land in the neighboring State of Nevada. In charge of each district was a forest inspector, and each individual forest reserve was directly under the administration of a forest supervisor.

The man directly on the ground was the forest ranger, responsible to the forest supervisor for the management of an area of public land ranging in size from two hundred thousand to half a million acres. The forest supervisor administered his reserve from a one or two-room office, scantily furnished and equipped, usually located in the mountain town nearest to the bulk of the lands under his supervision. The forest ranger's office and abode was generally a mountain cabin, if one was available, otherwise a canvas tent. Washington was a long way off in those days; field personnel were few and scattered; and the forest ranger back in the hills was pretty much on his own.

The forest inspectors, working directly under the headquarters at Washington, were generally technically-trained, professional foresters, whose education in the science of forestry had been supplemented by several years experience in the mountains of the West. Few of the first forest supervisors were technically-educated foresters, being mainly drawn from the ranks of the forest rangers recruited from among the residents of the mountain communities adjacent to the forest reserves. All were Civil Service employees.

Requirements for the job were rigid, physical fitness being the first consideration. The Civil Service examination for the position consumed two or three days and included rudimentary surveying, a working knowledge of timber and range activities, familiarity with local trees, shrubs and forage plants, a fair degree of skill in marksmanship and the ability to ride and pack.

Since the average mountain resident was accustomed to horses since infancy, he was invariably a first-class horseman, and used to transporting anything movable on the back of a pack animal. The candidates for the position of forest ranger were generally young stockmen, miners and woods workers, and those failing to pass the tests were usually disqualified because of their scant book-learning rather than for any lack of practical knowledge. A good reputation by the candidate in his home community, attested to by leading citizens, was also one of the main requirements.

Although contemporary Western history has surrounded the forest ranger with a tinge of glamour, to himself his job was anything but glamorous or romantic. It involved rather more than a fair share of hard work. Inherently a part of the community in which they lived, the early forest rangers also sometimes found themselves objects of enmity to their former associates when, as sole arbiters in some range dispute, they were forced to apply the policy of benefits to many as against the desires of the individual.

The early-day forest ranger was forester, cowman, sheepman, surveyor, lumberjack and woods policeman, rolled into one. He was adviser to the local population on irrigation, mining, farming and rural activities of every sort. He lived with the people and was one of them. Quite apart from the courage needed in his rather hazardous job of fire fighting, instances of personal courage were not at all rare among his kind. Although definitely allowed by law to carry firearms, he rarely had recourse to the six-shooter of Western lore and story, and often was not only the pacifier but also the sole unarmed participant in some bitter range quarrel.

The forest ranger built roads, trails and telephone lines; developed water for livestock; scaled timber, and for days and weeks on end fought the scourge of the mountains, the forest fire. His working hours were from sun to sun--and more--the only gauge to their duration being the need of finishing the job on which engaged. Mainly he traveled and worked alone, so resourcefulness and self-reliance were two of the main qualifications for retention of men in the position. To use a current term, those not able to "take it"--and there were many such--soon dropped from the ranks.

For years after the establishment of the forest reserves under the new departmental setup, the princely stipend paid a forest ranger was \$75 to \$100 per month. From his salary he was required to maintain two to four saddle and pack horses with equipment and to furnish himself and family--if he had one--with bed and board. He usually worked every day shown on the leaves of the calendar. In addition to his regular duties,

he often carried mail to outlying camps, brought sick or injured people to the nearest available medical care, and quite frequently acted as doctor or nurse himself.

Contacting in his daily work the prospector, miner, homesteader, logger, vaquero and shepherd, he became a sort of human clearing house in the life of isolated mountain communities--a Johnny-on-the-Spot man when emergencies arose. It is little wonder that the forest ranger was soon adopted as an integral part of California's rural life, respected and admired, and has held the same relative position through the ensuing years. The basic duties of the forest ranger have remained practically unchanged, in spite of the fact that as the years passed more and more technical forestry education has been required of candidates for the position.

Forest Service Administration

By 1914 each national forest had at least one technical forester, educated in silvicultural science, attached to its staff. To keep pace with the growing need of conservative range management and the demands of advancing animal husbandry, special technical grazing men were later brought into the ranks in areas where range management was a leading problem. These employees were a combination of forester, botanist and livestock farmer.

Two things somewhat bothered the early forest reserve administrators. The first was that the name "reserve" jarred on the consciousness of the new conservationists. The term smacked too strongly of "preserve" and preservation of natural resources,--putting them on ice, so to speak--was directly contrary to the concepts of land use held by Pinchot and his associates. On July 2, 1908, therefore, by national legislation the "forest reserves" became "national forests", as representing the best term to indicate their ownership by the people of the entire nation. By this name they have since been known.

The second matter bothering Western foresters was long distance administration. As the crux of the Forest Service policy of land use was that matters be settled on the ground as promptly as possible and dealing with Washington on major matters slowed up action, district offices were established in each of the six districts of the West, including California. San Francisco was named as the headquarters of the California district. Later, because the term "district" sometimes caused confusion with the ranger districts into which each national forest was divided, the more appropriate designation of "Region" was applied to the groups of national forests assembled under one executive head.

The wisdom of this move of decentralizing much of the responsibility for major administration and bringing it close to the national forest units was soon apparent, particularly in California where current problems existed which were not common to other forested areas of the West. F. E. Olmsted was the first officer in charge of California's eighteen national forests. He was succeeded in the summer of 1911 by Coert DuBois, whose place in turn was taken by Paul G. Redington in 1920.

The ideas of the foresters of the Department of Agriculture towards the end of the 19th Century were mainly gleaned from forestry methods and silvicultural practices carried on in the older lands of Europe. It was soon quite obvious that the policies and practices under which public forests were administered in the older lands, and on their often artificially-propagated timbered areas, could not be applied to the vast mountain regions of free America, and still follow our democratic principles of land use.

The miner wanted to develop lands for the purpose of extracting minerals from the earth and in the early years of the 20th Century, prospecting and the development of mining claims in the national forests was a free and untrammelled privilege, just the same as at present. The large and small cattle ranches often joined their natural, dependent open public range, or perhaps the ranches themselves lay entirely within the national forest withdrawal. Sheepmen had come to depend upon the green mountain pastures to fatten their lambs for market. Timber operators who under the Forest Service regulations could purchase trees by paying a nominal stumpage charge, had no intention of giving up their business when their industry was not protected from usurpation by bigger interests. Water users, big and little, needed the mountain waters for irrigation or the development of hydro-electric power. Urban residents wanted summer homes in the mountains. The rank and file of the citizenry, rural and urban, demanded the use of the mountain lands and their companion waters for hunting, fishing, and outdoor recreation generally.

These interests often clashed. Cattlemen complained that the hunters, fishermen, and campers disturbed the peaceful grazing of their livestock; sheepmen contended that cattlemen got more than their fair use of the range; persons asking for the exclusive use of some favored location for a summer home objected to the presence of smelly sheep in the immediate vicinity, and the hunters and fishermen demanded their full share of the use of mountain lands. The complex challenge of these varied uses was squarely met by the Forest Service under the early developed principle of multiple use. Still holding to the policy of the "greatest good of the greatest number in the long run", the highest use of the lands involved was the guiding principle of administration.

A picturesque canyon might have a high aesthetic value in providing summer homes for fifty families, the rental of which for this purpose would bring a gross return to the public purse of a thousand dollars a year, while the hundred head of sheep the canyon might support would produce a revenue of approximately seven dollars for three months use. From the human angle in this case there was the partial interests of one sheepman against that of fifty users of a different type; so the sheepman was pushed back.

The same canyon might be closely adjacent to some center of population seeking outdoor relaxation and in the face of its use by thousands annually, and on a no-charge basis, the use of this sector of land was denied to both the sheepman and the summer home applicants in favor of its free use by the thousands which it could serve as a summer camp and picnic ground.

To carry the illustration of this higher land use policy still further; if this particular canyon happened to be strategically located so that it was well adapted for use as a reservoir site to impound waters for farmland irrigation and hydro-electric development for a large number of users, this use of the land would transcend all others, and through inter-departmental action would be set aside for this purpose. In this case if not all at once, the sheepman, the summer home applicants and the public campers would all be denied the permanent use of the area in question, since irrigation water for thousands of acres of valley lands and electric light and power for rural and urban homes represented a higher use of lands than did all the others. If, however, the canyon reservoir site would benefit, say, only one or two small farms, then one of the higher uses would have the priority. By taking advantage of topography and shifting of use and development to adjacent areas, it was often possible to take care of all classes of users.

These multiple, diversified uses of the mountain lands, or public forests often were, as they still are, found within a single watershed of one of the national forests. Cattle, horses and sheep found pasturage; sawmills conducted logging operations; water users built their dams, ditches and flumes; prospectors roamed the area; miners sank their shafts; sportsmen hunted and fished; and campers set up their tents in public campgrounds reserved for their use, all in the same general area. These uses were often in close proximity to each other, and to a certain extent actually existent on the same lands.

Nominal fees were charged for all uses of national forest land which brought a profit to the user or which represented an exclusive use of any area. Fees were imposed for the pasturage of livestock on the open range, but if a grazing permittee was

given a special privilege of fencing part of his range and thereby securing an exclusive use thereof, an extra fee was charged for this special privilege. As stated before, a reasonable number of livestock currently used in farming operations by nearby settlers, were allowed free pasturage. Grazing uses of land such as pastures and corrals for the benefit of groups of stockmen; fences to control drift of livestock and projects involving development of water for irrigation, livestock or for domestic use, carried no charges.

The stumpage rate of timber was based upon its accessibility, nearness to market, species, and similar factors. A reasonable amount of timber for firewood and kindred uses was allowed settlers free of charge. Later, special low stumpage rates were established to allow farmers and settlers cheaper building materials, and in some sections of the State small sawmills operated on a custom cutting basis, manufacturing lumber for farm use secured by the farmers at these reduced rates.

As mentioned, there was no ban on mineral prospecting and the entryman of a bona fide mining claim was allowed to cut free of charge the timber thereon to be used for the development of the claim itself. Any forest products used for free general public benefit, such as road building and bridge construction materials, were allowed free of charge. Rights-of-way for roads and trails were given free.

Any use of land involving non-commercial water storage or transmission--water itself being a sovereign asset of the State--carried no charge to the user. Permits for any use of the land by the State, a county, or municipality, were free. It often happened that water storage had a double or triple use in that it was used for mining or irrigation operations and in addition for hydro-electric power development purposes. In such case, special use permit for the land involved, issued to the predominant user, provided for the other uses also.

Recreational use of the national forests such as hunting, fishing or camping, was always free. However, a person securing a summer home site on which to maintain a cabin or more pretentious structure for personal and exclusive use, was obliged to pay an annual rental for occupancy of the land. With the increasing use of the auto and extension of road systems in the mountain and plateau region, the demand for summer home sites reached a high volume, as people in the hot valleys or urban centers sought mountain retreats of their own. Segregation of areas for summer home sites, and special building restrictions to guard aesthetic values and as fire protection measures, were later necessary because of this ever-increasing demand.

The wisdom and foresight of the builders of the Forest Service land use policies became evident in later years. Special use permits were not granted in perpetuity but rather on an annual basis for a term of years, with revocable clauses in case the land was needed for a higher use or for a use of benefit to a greater number of people. Changing economic conditions brought about new trends in land use, and the fact that no use on a monopolistic basis was permitted under Forest Service regulations often proved invaluable in meeting later public demands for new uses.

The highest use of a well-watered mountain area in 1908 might have been as a pasture for a score or so of cattle. In 1920 the progress of highway development had perhaps brought thousands of people to this cow pasture. A public camp now replaced the cow pasture and it might be found that one of the cowman's family was making a prosperous livelihood in the operation of a store and service station on part of the land where the family cows formerly grazed. Invariably the permittee occupying the land under some form of special use was given every opportunity to retire his investment thereon, except in cases where the time of coming of the higher use had been definitely foreseen, in which case the user's lease had made provision accordingly.

By 1919 the total special land use permits in the national forests of California numbered 4,600, of which 2,565 carried an annual charge and the balance, representing irrigation, general public use, and home-building enterprises, were rent free. These special uses covered a wide range, from apiaries, schools and churches to mountain resorts, fur farms and farmers' telephone lines, embracing in their scope of use 100,000 acres and 4,400 miles of rights-of-way.

The most prevalent use of wild lands in the far Western States was, and is, livestock grazing. Almost every section of uncultivated land in California is used to a greater or lesser degree for the purpose which represented the original pastoral use of the lands of the State. The succulent forage of the mountains not only performed the function of converting this native herbage into beef, mutton and wool, but the mountain lands also served the purpose of getting livestock off the high-valued, fertile farm lands during the months of their highest producing capacity.

Utilization of the luxuriant annual growth of the higher lands also served the additional purpose of reducing fire hazard and fire was an ever-present threat to the timberlands and watershed cover. It was quite logical, therefore, although the predominating function of the national forests was timber production and protection of watersheds, that range management should take its place with them as an important land use activity.

With constantly increasing agricultural development, demand for national forest range far exceeded the available supply. Public domain of a still greater extent than covered by the national forest withdrawals was still free as the air above it and open to all comers, but much of the best part of it was being fenced as lands passed into private ownership under the various land acquisition laws. This factor alone stimulated the demand for national forest range.

The Forest Service met the various range problems as they came up. Areas of timberland, protected from fire through a period of years, acquired an undercover of young trees, often contemptuously referred to by the stockmen as "brush". If this young tree cover crowded out the annual grass feed, and reduced the carrying capacity of the range, and timber production was the best use of the land, that was the way the land was managed, regardless of the feelings of the stockmen in the matter. Fortunately change due to this sort of thing was gradual and the stockmen had time to make adjustments.

This factor of usurpation of range by potential timber was somewhat balanced out though, as increased timber utilization resulted in more open, cut-over lands on which livestock grazed. Then, too, as time went on, another type of wild land gradually opened up to limited grazing use. The vast fires which had swept the mountains in the past resulted in fields of brush such as manzanita, snowbrush and chamise, worthless from a timber standpoint. Protected from fire, young tree growth--the original cover of such areas--gradually appeared, in turn usurping and somewhat opening up the formerly impenetrable brush fields.

Close herding of sheep had been the prevailing practice in California since the days when prowling grizzlies forced the herders to round up their sheep into guarded campgrounds night after night. California sheep ranges on the national forests were greatly improved when the Forest Service insisted on open herding methods and prohibited the use of the same bed-ground night after night in succession.

Under this so-called "open herding" method, the shepherd carried his bed and board on the back of a burro, camping with his four-footed charges wherever night overtook him. The burros were easily trained to travel and graze with the sheep and the animal functioned as a sort of bell wether. In time the burro of the shepherd became as familiar a sight in the California forests as that of the roving prospector.

Limits were placed on the number of sheep which could be grazed in one band in charge of a single herder. Time limits were also imposed on bands of sheep crossing national forest range to private grazing lands and the guide system mentioned in a previous chapter thrown into the discard.

Both cowmen and sheepmen, eager to beat the other fellow to the range, had been in the habit of turning their stock on public lands as soon as the first green herbage showed, tramping out much more feed into the soft ground than was actually utilized by cattle, horses and sheep. This trampling and the practice of leaving stock out on the open range late in the season when the ground was again soft so as to utilize possible green feed started by the fall rains, had left many ranges in a sorry mess.

The Forest Service early established definite seasons, ranging from three months to yearlong, dependent upon local conditions of water, forage and climate, but yet sufficiently elastic to meet unusual climatic conditions. On some ranges feed could be utilized only during the winter months when rain or snow provided water, and factors such as this were always taken into consideration.

Rangers counted the stock either as they went on the range or while grazing thereon. Since the forest ranger was part and parcel of the local community, he usually knew just how many head of livestock were owned by each individual or concern grazing on his district. After the first few years of Forest Service administration, cases of wilful grazing trespass on any large scale were very rare on national forests.

Three classes of grazing permittees were recognized by the Forest Service. First came the small livestock operator who owned and resided on improved ranch property which was dependent upon national forest range for its best use. Often this type of user did not depend entirely upon livestock production for a livelihood but engaged in general farming. The production of beef pastured part of the year on public lands accounted for part of the income from his entire agricultural enterprise. This type of grazer was called Class A.

The second type, Class B permittees, were the larger owners, individuals or corporations, who owned improved ranch property dependent upon the public range for its highest use or who, whether ranch owners or not, from the steady use of public range through a consecutive period of years had come to depend upon the same as a means of livelihood.

The third type of permittee, designated as Class C, included all others. No permits could be issued to Class C applicants until Class A and B users had been provided for. Class C permittees' use of the range was temporary, and they gained no established preferences. If the type of Class B user who owned no improved, dependent ranch property dropped out for several years, he could qualify again as a recognized applicant for grazing preferences only by the acquisition of such dependent ranch property.

Stabilization in the use of the range for the home owner and permanent land user, and the use of the range to insure its best permanent production were the basic principles of the new grazing regulations, principles which the stockmen themselves came to realize represented the best and most intelligent form of grazing land use.

Sheep were banished entirely from the watersheds of Southern California where they had already played havoc with the steep, brush-covered slopes. Again it was a case of the highest land use and the "greatest good of the greatest number in the long run" in the matter of a few thousand sheep jeopardizing the precious water supply of communities and farms assessed at hundreds of millions of dollars.

To prevent monopoly in the use of the range maximum limits were set, beyond which number grazing preferences could not be secured. The keynote in numbers of permitted stock, however, was the protective limit. This was simply the number of stock which an individual permittee could run on the range to insure a comfortable livelihood. The small Class A man with commensurate, improved, dependent ranch property could build up his herd to the protective limit at the expense of Class C permittees. Dependent, commensurate, improved ranch property was defined as farm lands on which livestock could be adequately taken care of by forage produced thereon to maintain them during the period they were not on public range.

Any Class A or B permittee, if qualified by ownership of commensurate, dependent ranch property, could gradually build up to the maximum limit if range were available for all qualified users. Both maximum and protective limits were established to fit the different range areas and the economic conditions in the adjacent rural communities, and both were exceedingly fair. In the mountain and plateau region where bigger hay and livestock ranches were the rule, the maximum limit virtually placed the cowman in the cattle baron class. However, many cowmen and sheepmen also, ranging merely the protective limit number of livestock, were able to retire comfortably in their declining years and turn their animal husbandry operations over to their sons and heirs.

It must not be supposed that range management on the national forests of California was all clear sailing. Just as in the days of the Dons, drouth seasons struck, water holes dried up, feed was short, and irrigation water shortages at times resulted in light hay crops and scorched pastures depended upon to feed the livestock when they were not on the wild range lands. Blackleg, anthrax, scabies, and other diseases threatened or attacked flocks and herds, resulting in stock losses or the imposition of profit-taking treatment and quarantines. And

there was ever present the old range dispute of apportionment of grazing areas between cattle and sheep. Many of these problems were worked out, not by arbitrary action on the part of Forest Service officials, but through joint decisions of the federal officers and organizations representing permittees and users.

To encourage better breeding, handling and range use, and to deal with other problems connected with the industry, the California Wool Growers Association was organized away back in 1860, with eighteen charter members representing ownership of 64,825 sheep. The more independent cattlemen organized later. The California Wool Growers Association and the California Cattlemen's Association became component parts of two of the nation's greatest agricultural cooperatives.

Meanwhile, in communities all over the State, local livestock associations sprang up. These local cooperative bodies, while functioning for the betterment of the livestock industry in general, appointed advisory boards to deal with the Forest Service on matters affecting local range protection, apportionment and management. In spite of the fact that members of these local advisory boards often had selfish aims and axes of their own to grind, the net result was a better understanding between the grazing permittees with their problems on one hand, and the Forest Service with its obligation of multiple-land use management on the other.

The Forest Supervisors and forest rangers took an active part in organizing these users' cooperatives, and laid their cards frankly on the table in dealing with them. Usually any bone of contention between the organized grazers and the official range managers had as its basis the ever-prevailing principle of permanent, conservative use of lands, versus quick, temporary profits and monopolistic methods of range utilization.

It must be admitted that the sheepmen, although more or less nomads since the days of Abraham, on the start, at least, paid greater attention to breeding than the more firmly entrenched cattlemen. Forest officers, working with local and State-wide cooperatives, gradually banished scrub bulls from the range; their work also had the result of converting both classes of stockmen to the idea of better breeding practices and proper breeding seasons, so that lambs and calves were not dropped in the snowdrifts of the higher mountain valleys. Better handling of livestock on the open range came into vogue through systematic salting and riding.

The Forest Service, handicapped by lack of sufficient finances for range development, was aided by the local livestock associations levying assessments on their members to raise funds to match federal appropriations dollar for dollar, or to create

funds of their own for such work. Forest rangers, utilizing also incidental time of their summer fire guards, worked side by side with stockmen in developing range water, the eradication of poisonous plants, building fences, holding corrals, and in other range betterment activities.

Often the permanent forest rangers, establishing themselves in a temporary camp on some portion of their own national forest unit, worked through the entire period of winter snows on some range betterment project for the construction of which the organized stockmen had purchased the materials. Manual labor, isolation, and physical hardship were never strange to the forest ranger, often now a college graduate with a string of letters after his name.

Walter Dean Duke, leading cowman of northern California, used to tell of a considerable area of national forest land in the form of a panhandle, surrounded on three sides by public domain heavily grazed by transient sheep. Looking at this area from a vantage point several miles distant it appeared as though the panhandle was fenced, so great was the difference between the outside area where the native forage was eaten off and trampled into the ground, and the regulated grazing lands within the national forest boundary. Yet until a few years previously the entire area, inside the national forest and out, had for decades been subjected to the same treatment, illustrating the recuperating possibilities of wild lands under proper use and management.

The same conditions in general had existed throughout the mountains of California. John D. Coffman, leading United States Park Service forester, in commenting on range conditions in the California mountains as deplored by writers of the seventies, later wrote: "If such evidences of overgrazing were noticeable in 1873, think what it must have amounted to by the time such areas were placed under management within national forests".

In 1914 a last determined attempt was made to break down the Forest Service policy of protection of the little stockmen and local range user. This was an organized effort to go back in a sense to the trail herds of transient sheep of former times. Oregon sheepmen demanded a route to market for their stock from their remote mountain ranges to major transportation points in the Sacramento Valley. This involved crossing ranges used by local established cattle and sheep raisers over an area of five or six million acres in the counties and national forests of northern California. The initial request was a modest one, covering only a few thousand sheep to be limited to a driveway one-quarter of a mile wide. The District Forester of the California District, investigating the matter with local forest officers, found that if the precedent was

established it might include several hundred thousand head of sheep with their lambs virtually getting a summer's free feed just as in the good old days, and would practically put local stockmen along the route out of business.

The matter took on a national significance in livestock circles when Henry S. Graves, successor to Gifford Pinchot as Chief Forester of the United States, came West and met in joint conference with the hundreds of California stockmen and Oregon sheepmen involved.

The stormy sessions took on all the aspects of an old-time range war. City men sympathized with the Oregon flockmasters--located as they were in a vast inland empire with poor railroad transportation facilities--in their demand for a mere quarter-mile strip through public ranges, over which to get their lambs to market in an economical manner. Forest officers and stockmen, however, were not deluded by any quarter-mile wide route and knew that the hordes of sheep would spread over an area one hundred times that width or greater, law or no law--either that or the sheep would starve to death enroute. The demands of the Oregon sheepmen were denied.

Directed by C. E. Rachford, later chief of grazing for the U.S. Forest Service, a group of stockmen in northeastern California carried on some range studies of their own. The large fertile valleys of that region had not been settled till the late sixties or early seventies, at which time the ranges had been covered with waving fields of native bunch grass, saddle high. In 1880 the local cowmen disposed of their steers at two and three years of age, and the animals dressed out an average of 525 pounds. By 1903 when the ranges had been badly overgrazed by transient sheep and also misused by local cattle, the average dressed weight per steer had dropped to 480 pounds, and the stockmen were compelled to keep their animals until they were four or five years of age before marketing.

In 1905 the local range lands were included within a national forest withdrawal and regulated grazing use applied. By 1910 the average dressed weight of the steers had risen ten to fifteen pounds per head and the cattlemen were again putting them on the market at two and three years of age. In that same section in 1912, lambs marketed from national forest ranges weighed an average of 75 pounds; those from adjacent public domain on which grazing was unrestricted, marketed at the same time, showed an average weight of 60 pounds.

Will C. Barnes, Indian fighter, buffalo hunter, cowman, forester, and in later years nationally-known conservationist and author, in his book, "Western Grazing Grounds", published in 1913, wrote as follows:

"When the national forests were first formed and the government began to make a charge for grazing stock on them, the stockmen who had hitherto used the range without restrictions of any kind found great fault with the system. For several years there was in many parts of the West strong opposition to the plan. Today, however, there is no doubt that if it were left to the vote of the stockmen whether to abolish the national forests and allow grazing under the old conditions or continue under the present plan, 90 percent would be in favor of its continuance."

In 1916 science got into the harness in the matter of Forest Service range management and that year grazing reconnaissance, or grazing surveys, were started on the national forests by crews of botanical foresters and undergraduates in the same science. The work was handled in much the same manner as timber cruising, being in effect an inventory of forage resources. The range surveyors included in this detailed inventory availability and quantity of range water, estimated livestock carrying capacity, seasonal plant growth, climatic conditions, accessibility of different feeding areas and recommendations for the best use of the range lands in question, commensurate with timber and other uses of the same section.

These surveys became the basis of many future range management plans and although often laughed at as theoretical by hard-headed, old time stockmen, were largely drawn upon by local farmer land use planning committees themselves operating in later years. The technical knowledge of native plant life in California was greatly enhanced by these studies which were gradually spread out over all the more intensively-used range areas of the national forests.

During World War No. I the slogan, again so familiar, "Food will Win the War", echoed through the California countryside and was applied with full force to the livestock interests using California range lands. Already during the severe drouth of 1913 the protected ranges of the national forests had proven their value in providing emergency pasturage for thousands of cattle and sheep from the drouth-stricken lands of the southern San Joaquin Valley. To meet the wartime food demands, the national forest ranges were intentionally overstocked during the years of 1917, 1918 and over into 1919, summer pasturage being provided for about a quarter of a million additional animals in California alone.

There is no doubt but that this approximate twenty-five percent overstocking during the years of the last great war gave a temporary setback to conservative range management in the national forests, but the outstanding fact remains that by increase in numbers to regular users and the granting of new temporary permits, the range was able to meet the demands made upon it during the national emergency.

One of the outgrowths of wartime grazing was the requirement (not rigidly enforced till 1920) which barred aliens from sharing in the use of national forest range. As late as 1921, the United States Solicitor at Washington was challenging the validity of the Forest Service ruling that grazing users must be full-fledged citizens of the United States, but the forest officers stood by their guns on the matter and the aliens were barred.

Some interesting incidents in connection with this policy occurred about this time, reflecting in a sense on our easy-natured tolerance of alien land users. A majority of the sheepmen using the range included in the last big addition to the national forests of California, made in 1920, were born in Ireland. They had to a man taken out their first citizenship papers but, busily engaged in amassing sheep and lands in their adopted home, many of them had just neglected to complete the process of obtaining full citizenship status.

These men were solid people in their community and owners of valuable ranch lands dependent upon adjacent national forest range for their best use. They were also among the signers of the petition to Congress originally asking for the inclusion of this public domain within the national forest. Some of them were United States veterans of World War I. The citizenship ruling, which bid fair to wreck their livestock enterprises, caused a rush to the local courts for citizenship papers. Meanwhile, a special concession was worked out and their problem solved by granting them temporary permits and a stipulated time in which to perfect their citizenship status. The case of these Irish sheepmen had a good effect in that community of arousing the consciousness of other alien land-owners to a sense of their citizenship obligations.

Somewhat further to the south a middle-aged flockmaster ranged his sheep on unreserved public domain. Coming to the California and Nevada ranges as a boy from his birthplace in the Pyrenees, he had waxed wealthy in cash and livestock. He conceived the idea of qualifying himself as a national forest grazing permittee by purchase of the dependent ranch property and stock of a regular user, so called on the nearest forest officer. When asked concerning his citizenship status, he bluntly asserted that he was not a citizen of the United States nor did he intend to become one, preferring when he got ready, he said, to cash in on his assets and return to his native hills. When told that he had no chance of securing a national forest range permit under those circumstances, he mentioned highly-placed political friends and the fact that he would fight for his "rights" in the courts of the land. The young forest officer to whom he was talking coolly invited him to do so. This particular Basque land user did not get his grazing permit.

While, of course, hundreds of thousands of head of livestock produced in California never saw the national forest mountain ranges, the use of this land bulked large in the State's livestock industry and was quite a different angle of use from the livestock business confined to fenced farm lands. In Forest Service grazing administration there were many unwritten laws and practices which because of economic and human angles could not be expressed in official rules and regulations.

Generally speaking, while the big land owners' vested preference in the use of the range were fully recognized, the local forest rangers were prone to give the little owner or small stockman the best of the breaks, and even the regulations for the ranger's guidance expressed this rule of conduct, at least in spirit. There was often a social side in range matters as well as a cold-blooded official one, and the customs of the community sometimes produced rules not covered by the book. The charges of provincialism,--love of the land on which he labored and the attachment to the people of the sphere in which he moved, sometimes made by distant government administrators against the local forest officer--had a real basis in fact, since he was always an integral part of the community life and the interests of his own locality ranked high in his manner of thinking.

In 1909 there were 169,300 cattle and 353,000 sheep grazing on the national forests of California. In 1915 this number was 187,000 cattle and 398,000 sheep. Permitted stock in 1920 totaled 209,000 cattle and horses and 529,000 sheep, but part of this livestock represented a hang-over from wartime overstocking. We find also that as early as 1912 forest officers were handling grazing administration on almost eight million acres of additional private lands used in connection with national forest range, as the owners or lessees of these lands waived the right to their exclusive use, and their livestock were grazed on an "on and off" basis. The numbers of stock given above do not include work horses or cows grazed free of charge, and it must be remembered also that the Forest Service has never counted or collected fees on the natural increase of permitted stock which are under six months of age; the figures on permitted stock numbers, therefore, can be almost doubled.

As the auto brought modern transportation to the more isolated rural sections, better markets were created for general farm products and had the effect of somewhat reducing the number of small farmer-grazers. The class which grazed from 1 to 40 head of cattle dropped from 56.4 percent of the total number of permittees in 1908 to 51.3 percent of the total in 1920. By the same trend the class of cowmen running over 200 head of cattle each on the national forests increased from 5.9 percent of the total number of users in 1908 to 7.8 percent of the total grazers in 1920. The number of small permittees continued to slant downward in subsequent years, as farmers

trying to make a livelihood on submarginal lands gave up the struggle.

National Parks

Frequent reference has been made in these pages to the outstanding mountain area embraced in the great Yosemite National Park. Although lacking the spectacular geysers of the Yellowstone, the Yosemite, with its magnificent forests; its majestic mountain peaks, many of them rising to an elevation of over 13,000 feet; its rushing mountain streams and varied waterfalls, topped by the 1430-foot Upper Yosemite Falls; form a region second to none in the United States and perhaps in the world. Books written on this most popular California outdoor area in themselves fill a good-sized library, and there were many successors to the great John Muir in extolling its wonders.

Galen Clark, known as the "Guardian of the Yosemite", was one of its most ardent supporters till his death in 1910 at ninety-five years of age. David Curry back in 1899 started caring for the ever-increasing number of visitors to the area and in these efforts founded the later popular improved-type of California mountain camping resorts. John H. Williams, recognized later expert on the Yosemite, dedicated to the Sierra Club his interesting book with its inspiring pioneer pictures of the Park's natural features. Even world-wide travellers praised Yosemite's wonders, Horace Greeley saying it was "the most unique and stupendous sight" he had ever enjoyed, and Ralph Waldo Emerson remarking that the Yosemite Park was "the only spot he had ever seen which lived up to its written description".

The Army had done a good job in guarding our National Parks and the natty, blue-coated cavalymen added a colorful touch to the famous Yosemite and the equally famous groves of gigantic sequoia trees in the other National Parks. In spite of their efficiency as guardians, however, the soldiers were not foresters, botanists or mountaineers and their services, moreover, were needed elsewhere when war clouds began darkening the world's horizons. The United States Park Service, the organization which as a Bureau of the Interior Department has since been charged with the administration of the National Parks, therefore, was created in 1916.

Just as the 1905 letter of Secretary of Agriculture James Wilson was adopted as the guide of Forest Service policy, so the letter written in May 1918 by Secretary of the Interior Franklin K. Lane to Stephen T. Mather, first Director of the National Parks became what is termed by William Atherton DuPuy, "The Magna Charta" of the United States Park Service. This letter, establishing the administrative policy of the Park Service, reads in part as follows:

"First, that the National Parks must be maintained in absolutely unimpaired form for the use of future generations as well as those of our own time; second, that they are set apart for the use, observation, health and pleasure of the people; and third, that the national interest must dictate all decisions affecting public or private enterprise in the parks. Every activity of the service is subordinate to the duties imposed upon it to faithfully preserve the parks for posterity in their natural state...The educational as well as the recreational use of the National Parks should be encouraged in every practical way...The National Park system as now constituted should not be lowered in standard and dignity, and prestige by the inclusion of areas which express in less than the class or kind of exhibit which they represent."

It will thus be seen that two different types of mountain land under two entirely different methods of use were being administered by the Forest Service bureau and the park service bureau. The National Forests were dedicated to the principles of conservation,--use without abuse--for timber propagation, watershed protection, grazing and outdoor recreation; the National Parks were set aside on the basis of the "preservation" theory--to maintain the lands with the flora, fauna, geological formations or historic sites thereon unimpaired in the state of their natural or original existence, aesthetic values being the predominant factor in their administration.

Under the policies set up, therefore, a National Park must include a sufficient area of outstanding national value to warrant its permanent preservation. This theory of park service administration had already been challenged when in 1903 Mayor James D. Phelan of San Francisco made application for the use of Hetch Hetchy waters from the Yosemite Park area. This use was denied by Secretary of the Interior E. A. Hitchcock.

The waters impounded by the Hetch Hetchy Reservoir are of the same relative value to San Francisco as are the waters of Owens Valley and Boulder Dam projects to Los Angeles and its densely populated environs. The City of San Francisco had always been short of water. During the disastrous fires of the early years of its settlement even the plank paving of the streets went up in smoke along with the adjoining buildings because of water shortage. It is said that while one of these early-day fires was sweeping the city a merchant saved his plant and entire stock of other goods by quenching the fire with 80,000 gallons of vinegar which was a part of his stock of merchandise.

The Spring Valley Water Company, a merger of two earlier public utility concerns, had been serving the city with water since

1858 but besides the inadequacy of the supply, a large proportion of San Francisco's citizens were obsessed with the belief that their water and light systems should be municipally-owned. As far back as 1880 the California metropolis had been reaching out for an enlargement of its water supply and for a time considered the feasibility of tapping Lake Tahoe. After decades of investigation, Hetch Hetchy Valley, a natural reservoir with almost limitless water storage possibilities and an immense volume of water behind it, apparently offered the best solution for San Francisco's water problem.

A thirteen-year fight, involving thirsty San Francisco citizens on one hand and park service advocates and rural irrigationists on the other, followed the first denial to the city of the use of Hetch Hetchy as a reservoir site. The farmers of the Modesto and Turlock Irrigation Districts had some quarter million acres of irrigable farm lands, only a small part of which was under irrigation in the first decade of the century. However, the districts had filed under State laws on many times over the amount of water needed for their lands to be taken from the Tuolumne River, on the headwaters of which lay the Hetch Hetchy reservoir site.

The John E. Raker Hetch Hetchy Bill of 1913 was in time enacted into law by Congress and popular support of the measure seemed to indicate that quenching San Francisco's thirst was a more important land use than the aesthetic values which the water development area would have as part of the National Park.

The final settlement of the problem was that San Francisco got its own municipal water system as well as the electric power generated by construction of the Hetch Hetchy Dam. This was for public use only with the understanding that the use would never be in any way commercialized. The irrigators of the lands lying farther down the river were given priority use of enough water for 300,000 acres, more than they had asked for. The water and power were distributed through the medium of public utility concerns and the charges made by them were merely transmission costs.

Volumes have been written on the Hetch Hetchy problem. The long drawn-out fight against this form of public use of park lands carried on by supporters of the National Park system, was inspired by the fear that this project would set a precedent for further commercializing National Park areas. That their fears were not groundless is indicated by the fact that many later contests developed to open portions of the National Parks to such uses as grazing and water development. The park service, however, has generally successfully defended its basic policies on areas which were truly of National Park caliber.

When a law passed by the Congress appointed a commission from the Departments of War, Interior and Agriculture to handle the

leasing of public waters, including those in National Parks and Monuments, another bitter fight ensued. The final outcome of this was that control of such resources in existing National Parks was returned to Congress. During the progress of this struggle, Secretary of the Interior John B. Payne once remarked, "When you establish the principle that you can encroach on a National Park for irrigation or water power, you commence a process which will end only in the entire commercialization of them all".

The National Park Service fell heir to a considerable area of mountain lands in northern California with the creation of the Lassen Volcanic National Park on August 9, 1916. Mt. Lassen, which had been included in the Lassen National Forest since 1905, created international newspaper headlines when on the evening of May 30, 1914 the tree-clad mountain experienced a throwback to a former age and staged a spectacular eruption. This eruption was no half-hearted affair, but equaled the best efforts of famous volcanoes in other lands.

Newspapermen and news photographers ventured into the isolated backwoods country in which it was located. An early-day forest ranger, Harvey Abbey, noted for his woodsmanship and physical stamina, helped them to get the story to the outside world, including moving pictures of the first volcanic eruption ever witnessed by modern Americans on United States soil. Explorers of the volcanic mountain area suffered a lot of hardship during the early stages of this unusual phenomenon, and Ranger Abbey is credited with saving the lives of at least one large party.

Violent eruptions continued for months, one horizontal blowout of late May 1915 propelling before it a wall of mud and debris twenty feet high. Forest rangers warned settlers in the valley below and helped them to places of safety, so that although some hairbreadth escapes were recorded, no lives were lost. There was little argument relative to this area being of National Park caliber and 80,259 acres were eliminated from the Lassen National Forest to create the Lassen Volcanic National Park. Besides this new National Park, embracing the only active volcanic area in the United States, California now had the Yosemite, Sequoia, and General Grant National Parks, all areas of outstanding national significance containing approximately one million acres of public lands. It was a rather anomalous, and perhaps a just development, that a bureau in the same department of the government which since its creation had concerned itself largely with the giving away of public lands, should be the pioneer agency to initiate a return of private lands to public ownership. To the capable Stephen B. Mather, first Director of the National Park Service, goes

the credit for having roused public opinion sufficiently to allow the federal government to acquire private lands within National Park boundaries. Congress was loath to expend money for this purpose, but public-spirited organizations and individual citizens came to the rescue financially, among the largest donors being the National Geographic Society and the famous Sierra Club of California.

National Monuments, areas of outstanding geological, scenic, botanical or historic value, but not of sufficient magnitude to warrant National Park status, were also being acquired for permanent public use. Their administration was handled by the nearest federal public land administration agency. One of the first National Monuments created included a fine virgin stand of redwood on the slopes of Mt. Tamalpais, near San Francisco, donated to public use by William Kent in 1908. The same year the Pinnacles National Monument, located in San Benito County, an area of spire-like rock formations interspersed with caves, was set aside.

The Devil's Post Pile in the Sierra National Forest, a spectacular mass of basaltic columns, acquired National Monument status in 1911. In 1913, Point Cabrillo in San Diego County, the prominent headland which marked the discovery of the California coast by the Spaniards in 1542, was also set aside as a National Monument. California since 1908 had an outstanding State Park embracing 2,500 acres of gigantic redwood trees in the Big Basin section of Santa Cruz County. However, she was somewhat dilatory in following the example of the federal government in acquiring and dedicating to public use other areas of outstanding recreational, historic, or aesthetic value for some years.

The National Parks of California were actually being used by the public. In 1914 visitors to the Yosemite totaled 15,145 people. By 1919 this number had grown to 58,632 and in 1920, 68,906 visitors were recorded. The total number of visitors to all the National Parks of California, which in 1908 had been listed at 11,874, by 1919 was 81,000, and had grown to 113,600 in 1920.

Land Hunger and Homesteads

Whether the public agency involved was handling lands under the theory of "conservation" or "preservation", the first two decades of the 20th Century at least witnessed brakes applied to the exploitation and misuse of public lands and the lavish disposal of such lands and their resources to private owners. There was little agricultural land left on the public domain but optimists were still trying their luck on a bit of desert or on a sagebrush flat. Land hunger was rampant, and the West was still getting a large quota of hopeful homeseekers trying to acquire a small quota of free government land.

Within the National Forests here and there were open areas and mountain meadows which often during the season of lush growth looked invitingly like good farm lands. Then, too, many people held to the theory that since they were part owners of the public domain anyway, the government owed them a quarter section of land which they could call their very own. In the early 1900's a mighty howl of protest to the effect that land in the National Forests was being locked up against agricultural development reached the halls of Congress and led to the passage of what is known as the Forest Homestead Law. This law proved a thorn in the flesh to California foresters and national legislators alike for many years.

The Forest Homestead Act became law on June 11, 1906. It opened up new vistas of land exploitation, and was a sinecure for crooked land locators. The law was intended primarily for the protection of homesteaders on potential agricultural lands on which they had filed prior to their inclusion within a National Forest. It was also for the opening to settlement of occasional small pieces of land having an agricultural value greater than their worth for forestry purposes. However, the wording of the law, was quite broad provided that any land chiefly valuable for agricultural purposes which could be used without injury to timber production and which was not needed for public use, would be listed with the Department of the Interior for opening to settlement and entry.

It will be recalled that in the creation of forest reserves authority to handle transactions having to do with the acquisition of land by private interests was still vested in the Interior Department. There were two methods now open whereby title to public lands within the National Forests might be acquired; first, under the mining laws and second, by virtue of this new homestead law. Further along in these pages detailed figures will be given dealing with the acquisition and use of lands acquired by private owners by means of mining claims and forest homesteads.

The Forest Service had no objection to allowing homesteads within the National Forests provided that the lands involved were agricultural in character and were not needed for timber production or watershed protection. The creation and development of small, independent, home-building enterprises was one of the basic principles of the Forest Service conception of land use, but the definition of homesteaders and that of the Forest Service officials of what constituted agricultural land often differed greatly. Many times also the homesteader was merely the tool of some bigger interests seeking to acquire a certain tract of land valuable for a reservoir site, or for some other private purpose.

"Yes", the forest ranger might agree, in looking over a certain tract of land with a prospective entryman, "the soil is deep and rich and the land is not primarily adapted for timber growth; but before you invest your time and money in the development of this tract of land for a farm, consider the following factors: The land lies at such an elevation that killing frosts are liable to occur any month in the year; there is no water available for irrigation and even in a favorable year all you can produce is an indifferent crop of rye hay. If in this occasional lucky year you are able to produce a crop, where are you going to find a market? Better get yourself a few acres of farm land down in the proven valley area where you have climate, water and available markets to go with the land. It will cost you very much less in the long run".

Invariably, the ranger's advice fell on deaf ears. He was obligated in any case to survey the tract and fill out and send through official channels the homesteader's application for the land. If the land was not chiefly valuable for the growing of trees he had no recourse under the law but to recommend its listing for opening to settlement and entry. In due time another 160 acres of submarginal agricultural public land passed into private ownership, with a disillusioned little lander realizing too late the soundness of the forester's advice.

Sometimes a forest homestead applicant selected a piece of land very obviously non-agricultural in character or possibly well adapted for forest growth. His application to have it listed with the Department of the Interior for opening to settlement and entry was then recommended for disapproval. Perhaps the applicant wanted the land for a summer home; possibly for some future commercial use which the local forest officer could foresee. When the application was denied the general procedure was for the applicant to write his Congressman or Senator asking for reconsideration of the case. Often the applicant won out, over the protests of the local forest officers.

For years legislators in Washington were literally buried beneath an avalanche of correspondence sent in by constituents insisting that they were entitled to a certain tract of land under the Forest Homestead Law. One land hungry applicant included the following statement in his protest to public officials denying him the right of homestead entry on a certain tract of National Forest land:

"By the inherent right of the unwritten Cosmic Law, born on the sacred land created for universal physical expression, I am entitled to a fraction of land on this speck called Earth upon which to fulfill my creative purpose and to sustain and express my physical, mental and spiritual being, and to enjoy life, liberty and the pursuit of happiness."

To many people of little or no means the possession of a piece of California land represented the fulfillment of years of dreaming, and if such a tract of land could be secured free so much the better. In vain forest officers of the California Region protested the opening of certain National Forest lands to settlement and entry on the grounds that there was not only much doubt as to their agricultural character, but that the lands would be badly needed in the future for a higher public use than that represented by submarginal land farming. Invariably, later years proved that the local officers were correct and invariably also their protests were overruled. Eastern investigators, unacquainted with Western lands and farming conditions, making a re-examination in a disputed case generally decided in favor of the homestead applicant. Government agencies had so long been committed to a policy of disposal of public lands that the custom was too deeply ingrained to be easily changed. The benefit of the doubt was always given to the settler.

Thousands of acres were eliminated entirely from some of the National Forests in localities where possible forest homestead lands formed a compact body, to take their place again in the free-for-all public domain. It will be noted that the Forest Homestead Law exempted from its workings lands needed for public use in administration of the National Forests. Hundreds of administrative sites - potential forest homesteads, but embracing lands for which forest officers could foresee a higher future use--were withdrawn under this section of the act as a measure to save such lands for future use. In 1909 Secretary of the Interior Richard Ballinger challenged the Forest Service on this point and of the 2,565 administrative sites withdrawn from entry on the Western National Forests, he revoked 149 of them embracing 25,595 acres on the basis that the withdrawals were "detrimental to Western interests".

The whole matter of agricultural lands within the National Forests reached a final issue with the enactment of laws in 1912 and 1913 whereby the Secretary of Agriculture was directed to classify and segregate all lands that were chiefly valuable for agriculture. Undertaken in the nature of a detailed survey, the work was soon completed on all the National Forests of California. Forest officers were particularly lenient in this classification in that all lands having any potential value for agriculture and not timbered,

were listed for opening to entry. This included some areas previously withdrawn as administrative sites.

The fiasco of the Forest Homestead Law is somewhat proven by the fact that after this classification had been completed, thousands of acres of land in California's National Forests, listed by the Forest Service officers themselves as having agricultural possibilities, were never filed upon but eventually reverted to perpetual public ownership. The sight of abandoned forest homesteads had a decidedly deterring effect on future homesteaders. Many of the entries that were taken up under the Forest Homestead Law after the classification job had been completed lay contiguous to large holdings of operating livestock producers who eventually secured the lands for pasturage of their stock.

In 1909 there were still eight land districts in California charged with the administration of 28,614,931 acres of yet unappropriated, unreserved public domain. That these eight federal land districts were still doing a "land office" business is evidenced by the fact that a year later State statisticians reported that this unreserved public land area had shrunk to 23,362,964. Evidently a lot of people were still willing to take a chance of eking out an existence on a government claim, and a benevolent government was perfectly willing that these homesteaders would be given that chance to become landed proprietors. On June 6, 1912, the original homestead law was amended so as to require only three years resident on the land to acquire patent thereto, in place of the former five years.

Not all these lands passed into private ownership through the operation of the homestead laws, however. In 1912 Congress enacted legislation whereby up to 160 acres of land, if the bulk of the area was uncultivable, could be purchased at the old standby rate of \$1.25 per acre by the owners of adjacent or surrounding lands. Such lands, comprising relatively small areas entirely surrounded by private lands, were known as "isolated" tracts. This Isolated Tract Law afforded an opportunity to mountain ranchers and similar land owners to square up their land holdings into a more compact body.

It was realized by the Washington lawmakers that homesteading on the general public domain was no longer a profitable agriculture venture, yet the demand by a land-hungry population for free land in the Western States continued unabated. Evidently on the theory that if a man had a bigger volume of land which was of doubtful agricultural value in the first place he might have a better chance of building up a successful farm enterprise, Congress on February 5, 1909 passed the Enlarged Homestead Act. This allowed an entryman to file on and obtain

patent to 320 acres instead of the 160 acres allowed under the old law, provided the entered lands represented poor soil. The new homestead act was, of course, applicable to all unreserved public lands in California. This Enlarged Homestead Law presupposed dry farming ventures and was responsible for much of the private, misused submarginal farm lands of later years.

A half section of such unreserved public lands as were left in the West was still an insufficient area from which even the most industrious farm family could wrest a livelihood, so on December 29, 1916 Congress enacted the Stock-Raising Homestead Act. This new law was frankly worded as applying to non-agricultural lands;--"which are chiefly valuable for grazing and raising forage crops, which do not contain merchantable timber, are not susceptible of irrigation from any known source of water supply, and are of such a character that 640 acres are reasonably required to support a family". Not only did this law allow an entryman 640 acres under its own provisions, but he could also have in addition a regular homestead of 160 acres of potentially agricultural land. A law such as this, which allowed the acquisition of a veritable little land empire, had an appeal all its own to land-hungry people honestly seeking to carve out a home on Western wild lands, but was of still greater value to large livestock owners seeking to increase their range holdings.

The Grazing, or Stockraising Homestead Law, did not require cultivation of land, the entryman being merely obligated to invest not less than \$800 in improvements on the 640 acres. Since a large part of his investment could be represented by his own labor or that of his family, it was a cheap way to acquire a considerable tract of land. A rough shack, perhaps a dug well if water could be reached, home-made corrals, and some sketchy fencing, easily made up the value of the entire investment required. The entryman, as in other homestead laws, was required to live only seven months in the year on the land taken up.

This Grazing Homestead Act was one of the most liberal of all laws in the history of land transition from public to private ownership, its chief alleviating feature being the fact that the acre unit value of the lands involved was very low. Eastern Congressmen supporting the measure were in general unacquainted with Western conditions. Used to the current rains which kept forage green and growing through the summer months in their own states, they could hardly be expected to realize that the 640 acres included in the average grazing homestead of California's hinterlands would be taxed to the utmost to support twenty head of cattle yearlong.

The enlarged homestead and the grazing homestead legislation together resulted in a large volume of public lands passing into private ownership. Surprisingly, however, the Grazing Homestead Law did not prove as popular with land grabbers in California as in some of the other public land states. There was an open frankness about the workings of the law. The entryman, if an independent settler, could expend the few hundred dollars required in improvements, largely his own labor, and after enjoying a comparatively short time of healthful, outdoor living, secure title and sometimes sell his section of land for as much as \$2,000.

The entryman usually admitted frankly that he was actuated by speculative motives. If he were taking up the land for an adjacent stockman, he was generally fairly well reimbursed for his "homesteading" services and ordinarily took little trouble to conceal his plans for the eventual disposal of the land. In most cases the land was used from the start by the sponsoring stockman, anyway. The functioning of either of these latest homestead laws resulted in few permanent rural homes in California; in fact, it would be hard to find an instance among the thousands of stock-raising homesteads in California patented under the 1916 law, where the land became a permanent home.

With these broader laws on the statute books, the days of public land acquisition were not over by any means. This is evidenced by the fact that in 1919 a total of 520,593 acres were entered under the various homestead laws in California. The following year 913,621 acres were filed upon, inclusive of filings on lands in Indian reservations which had been thrown open to settlement and entry.

Indians and Land

By various and devious processes most of the remaining Indian lands adaptable for cultivation had passed from the custodianship of the government into the hands of private white owners, mostly at a fraction of their real value. One land baron, William S. Chapman, celebrated as a land scrip specialist, had acquired approximately 350,000 acres by buying half breed scrip at the rate of fifty cents to a dollar and a quarter an acre.

California Indians were mostly living on reservations or eking out an existence on their rocky, waterless allotments. In spite of the championing of their cause by leading philanthropists and writers, in the second decade of the Twentieth Century the lot of the Indians in the wealthy State of California particularly in the Mountain and Plateau Region was the dilapidated Indian shacks and hovels, or of groups of Indians

patiently waiting for some gift of subsistence from their prosperous white neighbors. The terms "noble" and "free" could certainly not be applied to members of the race.

That the Indians were trying to adapt themselves to a happy medium of white man's ways is shown by the records of school enrollment of Indian youth between the ages of ten and twenty. In 1900 this enrollment had been 1,623; in 1912, 2,029 were attending school; in 1916, Indian students of this age class numbered 3,231 and by 1920 a total of 4,120 were enrolled.

In 1910 sixty-three percent of all Indians in California were illiterate, but by 1920 this percentage had dropped to thirty-five. In 1920 also federal statisticians reported that while the percentage of illiteracy in rural California among foreign-born whites between the ages of ten and twenty was 16.1 percent, there were only 5.4 percent illiterate Indian children of the same age in the State's rural districts. The total Indian population that year was listed at approximately 17,000.

The amount of government funds expended for the benefit of California Indians was pitifully small in view of the rich tribal lands which had been taken away from them, and which were really theirs by right of inheritance. For support, education, medical attention, irrigation and water supply for their lands, the amount allotted is shown by the Office of Indian Affairs as \$241,000 in 1903. Ten years later, or in 1913, the amount expended for the same purpose was \$213,000.

Indians of the West, reduced in numbers and cowed as they were, were still resentful of the neglect of their land rights. Often they were still at this late date in a state of near rebellion. The last Indian campaign of the West is often overlooked by contemporary historians. This did not take place in the 1890's, but two decades later; it was not fought by Uncle Sam's blue-coated soldiers, but by California and Nevada farmers serving as a posse under the leadership of peace officers of the two States. It was a rather stirring little Indian campaign while it lasted and cost the lives of several California farmers.

In the fall of 1910 Shoshone Mike, a renegade Indian, gathered a group of his kind about him and swept down from the wild lands of Idaho through Western Nevada, crossing into Modoc County, California. Shortly afterward he returned to Little High Rock Canyon, an isolated section of Nevada just east of the California State line.

In February 1911 friends of four Surprise Valley stockmen who ranged cattle and sheep on Nevada winter range, became alarmed at their prolonged absence and a party was sent out to investigate. The four frozen bodies of the California stockmen, mutilated, partially stripped, and robbed of their weapons, were found close together in the snow near the deserted High Rock Canyon camp. Whether they were shot from ambush or killed in an attack on the Indian camp will never be known.

A mounted posse of California farmers was organized and joining a similar force from Nevada, set out on the trail of the Indians. Time and again contact was made with the Indian band, but each time they broke through the cordon of their white pursuers.

The chase through the semi-desert Nevada country took on all the aspects of the Indian campaigns of half a century previously. Finally, the Indian band was cornered. As the surrounding white force drew near, the Indians broke into their death chant and opened fire with both bows and arrows and modern firearms. Shouting their war cries and beating Indian drums, the squaws fought with the same ferocity as their men folks. One of the white casualties was a young Nevada State policeman who sacrificed his life in trying to disarm a squaw without doing her bodily harm. The Indian band fought to the death. The sole survivor was an eight-year old girl who clawed at her captors like a wildcat and who was later tamed only after months of kind treatment by Indian Service employees.

Timber Management

While federal agencies were engaged in programs to save the timber stand of the State from further exploitation and misuse, the State Board of Forestry was doing everything possible to prod rather complacent legislators into concrete action along the same lines. In the opening years of the 20th Century little more was known of the State's timber resources than in 1889 when the State Forestry agency, deploring the inroads on the virgin redwood forests had optimistically mentioned the "apparently boundless timber supply" of the Sierra Nevadas.

In 1903 the State's official forestry body had turned over to the new federal forestry organization the task of estimating the timber stands and watershed values. The job was completed in 1907. Since it involved the examination of some twenty-one million acres of the roughest terrain of the State by the widely-scattered force of the federal Forest Service, the method of obtaining the data was somewhat crude, especially in the light of the detailed, systematic timber survey practices of later years.

The old-time forest rangers of the non-technical type based their estimates of timber stands on observations made while riding through the timbered area or by closely scanning the county from some prominent peak. However, many of these rough inventories were later found to be surprisingly accurate. In any case, these first estimates impressed upon the minds of the State leaders the fact that California's timber resources had not the limitless volume guessed at in former times.

Special timber cruising practices, following technical methods, were started by the Forest Service in 1910 and formed the basis of timber management plans initiated by the federal agency the following year. As demand for timber became greater, timber cruising work and following timber management plans spread out over a large area of the public timberlands of the State. In 1919 and 1920 the work of timber estimating and resultant working plans for certain areas or for the entire National Forest unit concerned was very greatly systematized, the essential technical details being much the same as those practiced at the present time.

In timber reconnaissance, or timber surveys, the tree cover on each individual forty acres was estimated by actually counting all trees on either five percent or ten percent of the area, depending upon what demands for lumber use would be made in that particular locality. After the first years this work was mainly done by special timber survey parties working in crews of two men each from a centrally-located mobile camp. Sometimes the work was performed on snowshoes by regular forest rangers during winter months.

The two-man crew consisted of an estimator and compassman, the estimates being based on a strip either one chain wide for a five percent cruise or two chains wide for a ten percent cruise, through the forty-acre subdivision concerned. The cruisers not only listed the trees by age classes, size and species, but made detailed notes also on reproduction growth, topography, slope and other factors. In an intensive cruise of timber land, nothing was left to chance or guess, actual measurements being taken of trees and distances checked by surveyor's chain periodically, to verify by mechanical means ocular estimates and paced distances.

Later on in the central camp or in a distant office, the "forty" cruise sheets on which the field data was recorded were computed and the data correlated, forty by forty, section by section, and township by township, until the timber resources of an entire watershed or other specific area was assembled. Since the timber cruiser also made a detailed plat on the ground of each forty cruised, an accurate map of the country was also obtained.

As the work involved retracing of land survey lines and in some cases of an original survey of the area, the cruisers placed metal tags, readable by almost any layman, at section and quarter-section corners and where land lines crossed roads and trails. In addition to the working value of these markers, later on more than one lost traveler has owed his life, or at least an escape from considerable hardship, by stumbling on one of these tags tacked on a tree by some youthful timber cruiser years before.

With these detailed estimates in hand, a knowledge of the topography and other factors assembled, the forester-executives were able to make plans for the best utilization of the timber on the area concerned. Always the basic principle of the permanency of use was kept uppermost in the minds of the planners. A considerable belt of timber adjacent to populous farming communities might be set aside for permanent local use.

On the other hand, it might be the basis of one large or several small logging operations extending over a long period of years. If possible to do so with a fair profit to the operator, the period of operation was made of such sufficiently long duration that the cutting of the ripe or mature timber would be constantly succeeded by logging of the younger trees which had meanwhile reached maturity. Even on the larger logging operations which might embrace the founding of a woods town and construction of miles of logging railroad, there was no ban on other forest land uses such as grazing and recreation, except perhaps for a circumscribed area within current logging operations.

Always the forestry planners kept in mind as a priority the needs of local communities, and always the principle of highest use was considered. A patch of trees might contain valuable lumber for the loggers, but if the location lent itself readily for use as a public campground through the medium of which there would be furnished rest and relaxation to thousands of people, the trees were reserved from cutting. Or it might happen that on such an area many of the mature, and perhaps overmature, trees could be removed, still leaving plenty of shade and perhaps even improving the area; in such case the selected trees were sold to the lumberman and the needs of both classes of users adequately served.

The forest planners took into consideration location of saw-mills, logging camps, logging roads and railroads, available water, and similar factors. They had need to become expert at figuring operating costs, profits, marketing costs, lumber prices and investment charges based on an average of a long period of years so as to determine values to fit these factors.

The Forest Service at times refused to make sales of stumpage where it could be foreseen that the operator might suffer loss in a long term operation. Promoters, visualizing quick, immediate profits, were not lacking and as in the case of major range problems, clashes between would-be sawmill operators and administrators of public timberlands sometimes reached the halls of Congress itself. At times chambers of commerce, or perhaps unscrupulous promoters, could not accept the Forest Service theory of "the greatest good of the greatest number in the long run".

A wide range of use soon marked the timber harvest of the National Forests. Sawtimber (lumber), shingles, fence posts, telephone and telegraph poles, marine piling, railroad ties, mining timbers, fuel and even Christmas trees, were among the products harvested by the timber operators. The smaller operations involved in cutting such items as fuel or fence posts were handled on the basis of direct deals on the ground. Bigger transactions involved awarding of contracts on the basis of competitive bidding after public advertising.

The complex problem of timberland management and use on the National Forests represents such an immense subject that volumes could, and have been written on the subject, and only the salient points will be touched upon here. Economic conditions, markets, methods of logging, and kindred factors often changed so rapidly that revisions of carefully-laid management plans,--always with the underlying principle of intelligent land use in mind--were constantly necessary. To add to the worries of the forester there was also the ever-present threat of fire increasing in intensity with the increasing human use of mountain lands. Moreover, just as in the farmer's orchards, increased intercourse with the outside world brought diseases to forest trees, and insect pests allied themselves with fire as an enemy to native tree growth. Sudden changes in management plans and immediate utilization of timber being held for future use was sometimes necessary to save the waste of fire-killed trees or those threatened by the inroads of parasites.

Silvicultural practices were established to fit economic conditions on public timber lands by 1920. Up to the time of administration of the National Forests, timber operators stripped everything they needed from a tract of timber and left the area just as it was when the last log was pulled from its tangle of surrounding limbs and debris. Conservationists called this "timber mining"--an appropriate term because of its resemblance to the work of the gold miner who in extracting gold from the earth, paid no attention to any devastation wrought on the land. Since the underlying principle of the new regime was to keep the land producing for all time,

operators on National Forests often objected as the foresters insisted that they make an about face in their methods of timber harvesting and utilization. Right from the start the public land foresters made it plain that timber harvesting operations must proceed without the devastation of former years.

The first timber management rangers were often lumberjacks; sometimes former small timber operators. In dealing with their former associates they had the advantage of knowing all the tricks of the trade. They soon had the additional benefit of the advice of technically-trained silicultural experts.

A contract with the timber operator having been negotiated, the first process on a timber sale was marking the trees to be taken. This involved cutting so as to insure the best perpetual stand of timber on the area for future harvesting. During the first years of Forest Service administration at least a third of the merchantable timber was left on the cutting area, to provide seed trees and protection shelter for young growth. By 1916, seventy to eighty percent of the merchantable stand was being marked for cutting under rather stringent standardized rules.

Based on detailed studies made on the ground by S. B. Show and other expert foresters, national and local, the present day tree marking principles for cutting timber on National Forests were established in 1918 and 1919. The new practice eliminated rule of thumb marking by the book and ushered in what might be termed common sense methods of marking trees for cutting under which practical foresters, sizing up an entire area to be harvested, combined present utilization with the needs of insuring a future stand without reference to standard volume percentages. On any sizeable logging operation thereafter, the purchaser accompanied forest officers over the area on a sample marking expedition and in his contract agreed to the marking practices thereby outlined.

Outside the redwood belt, the main lumber trees in California are the Ponderosa pine (called also in the recent past "yellow pine" and "Western yellow pine"), its close companion the Jeffrey pine, sugar pine, and Douglas-fir. These species rarely occur in pure stands in the Sierra but are mixed with white fir and incense cedar, the products from which made lumber not readily accepted in trade channels and were often a drug on the market. The best forestry practices demanded that the mature trees of these species be cut as well as the more valuable lumber trees. To encourage their utilization, stumpage prices were usually a small fraction of the rates set for the better species. Occasionally, trees of these species were cut and paid for by the operator but not manufactured into lumber at all. In such case the logs were

disposed of in some manner agreed upon, the stumpage prices for the timber on the entire area having been based on the volume of these low-grade lumber trees which must be handled. The idea of removing these trees was to prevent the future timber stand becoming predominantly these inferior species.

The same marking and silvicultural practices were followed in general where farmers cut a few trees for local use, as those on the bigger logging operations.

One main reason for forest devastation in the United States had always been the brush and debris left on the ground by logging operations, on account of its extreme inflammability. From the very start of National Forest administration, Forest Service officials required that brush and debris be piled a safe distance from living trees and young growth in small, compact heaps. This brush was burned during the late fall or early winter months, thus clearing the forest floor of inflammable debris resulting from logging. In some of the more lightly-timbered National Forest areas of the State, brush from small cutting operations was thrown into nearby gullies and washes instead of being piled and burned, thus doing its part in checking soil erosion.

Fire protection was always a major consideration on timber cutting areas and special protection measures were taken such as construction of firebreaks, cleared lines around fuel-burning machinery, and special smoking restrictions. Operators were also compelled to fell dead trees and snags on the area covered by their timber sale contracts, so as to avoid them becoming fire-scattering torches in case of fire. Logging roads constructed by the loggers became firebreaks and fire control roads maintained by the Forest Service as such after the area had been logged off.

The old method of skidding logs was superseded by the use of big wheels to raise logs off the ground during this period. Under the big wheel logging system the logs were hauled to the mill pond or railroad by one end of the log being raised from the ground under the high-arched axle of the big wheels, six or eight feet in diameter. In rugged terrain a good deal of logging was done by bunching the logs by means of high lead cables, operated by power furnished by the well-known donkey engine, a method of logging still very much in use in the steep coast Douglas-fir country. These donkey engines, first operated by steam, were later powered by gasoline. California has always been a leader in mobile machinery used in farming, mining, lumbering and other activities in rural sections, and invention and adoption of machine logging equipment kept pace with similar machine development on the farm lands of the State.

In 1920 it might be said that the machine age was just getting well under way, and gasoline machinery was beginning to replace horseflesh, peevies, and back muscles in the California forests. When the first caterpillar tractors made their advent in California logging that year, foresters looked askance at their potentialities for crushing the young growth on which was based their hopes for future forests.

State Forestry and Rural Fire Hazard

Going back to the activities of the State Board of Forestry, we find that one of the good results of the joint examination of federal and State lands carried on from 1903 to 1907 was the matter of legislation providing for an exchange system whereby national and State holdings might be consolidated. Most of the State timberlands were gone, so that the considerable volume of lands later exchanged between the federal and State agencies generally represented woodland or grazing lands.

During the 1905 to 1920 period we see the State agency, handicapped by lack of funds, leaning more and more on the cooperative aid given by the federal forest officers. As has been pointed out by M. B. Pratt, retired State Forester, up to 1919 California had a State Forester and a State Board of Forestry but practically no funds on which to operate. Meanwhile forestry and closely related problems had become somewhat of a paramount issue in State land use administration.

The federal Forest Service, itself perennially undermanned, was pretty well occupied in the administration of twenty million-odd acres of the higher-lying wild lands. There was, however, much more than that amount included in the unreserved public domain, and the State had considerable wild lands of its own. With increasing population and increasing use of the hinterlands, the seriousness of the fire situation in rural California became more than ever evident, and recurring timber, brush, grass and grain land fires became a major problem. Nearly all of the public domain and State lands were brush-covered, with a greater or lesser degree of inflammability, but any fire protection given the yet vast public domain must come from the State or the Forest Service. Also there were a great many of these wild lands, timbered or otherwise, in the hands of private owners. Few of these, mainly non-resident owners of idle lands, were interested in their protection, if it involved any cash outlay on their part.

During the extremely bad fire season of 1910 a disastrous fire was raging in a fine stand of private timber in northeastern California, threatening other nearby private lands, and adjacent National Forest areas. The local forest supervisor wired the

facts to the lumber magnate on whose lands the fire was raging. A wired reply came back: "Endless hopeless job fight forest fires stop think it not right principle stop burn now than few years later". It did--a wonderful stand of timber went up in smoke. Several years later this same owner had established a resident California agent with full executive authority to look after his extensive timberland interests. This agent, upon being wired relative to a large fire burning under similar circumstances to the one previously mentioned, replied somewhat leisurely to the effect that he was busy with office work and would look into the matter of the devastating fire later.

Many thousands of acres of California's finest private timberlands were ravaged by fire and reverted to worthless brush fields, a big loss to the nation but a comparatively small one to the owners who had originally acquired them for practically nothing. Federal officers were often compelled to fight fires on public domain, State or private lands to prevent them from spreading over contiguous National Forest lands.

The community center of Four Corners was not much concerned over fire hazard problems when it consisted of merely a post office, school, church, blacksmith shop and store. When it acquired village status a volunteer bucket brigade took care of the fire problem in a fairly adequate manner. As a bustling little town it invested funds to provide fire-fighting equipment used by an organized volunteer fire department. When Four Corners eventually blossomed forth into an important urban center the need for fire protection was quite obvious and as a routine, common sense precaution, provision was made for a pressure water system, modern fire-fighting apparatus, and a paid fire department.

It sometimes seems strange that those with the power to do so are usually slow in applying progressive action in such matters as rural fire and police protection in somewhat the same manner as they normally develop in urban centers. Yet the situation is quite analogous; there is just as much relative difference in the degree of fire hazard in a rural area on which thousands of small farmers are operating, grown from a couple of big cattle ranches, as there is in the urban center which has stretched from village to city status.

The California State Board of Forestry grasped at every opportunity to provide ways and means of coping with the rural fire situation. G. B. Lull, State Forester from 1906 to 1909, worked out with the federal foresters the cooperative angle provided for under Forest Service rules, of appointing each permanent federal forest officer a State fire warden. In addition to the appointment of 269 such in the Forest Service ranks, he secured the appointment of 721 voluntary fire wardens throughout California to serve on somewhat the same basis as present dollar-a-

year-men in the government service, except that these volunteer wardens were usually paid prevailing wages when fire-fighting duties called them into active service. In addition to strengthening the State organization, this plan has worked out pretty well through the years for the federal agency also, since fire law violators are apprehended and brought to justice more quickly under the local laws than through the slower-working processes of the federal statutes.

G. M. Homans, State Forester from 1910 till his death in 1921, struggled along with the State's forestry problems. In 1915 a little more recognition was given these problems with the biggest appropriation yet made, \$45,800. In 1917 State Forestry affairs took another step forward when a tree nursery was established at the University of California farm at Davis in Yolo County.

One of the biggest legislative moves dealing with forestry and water conservation during the 1905-1920 period of California history was the passage of the Weeks Law by the national Congress on March 1, 1911, with major amendments being made thereto in 1913 and 1914. Briefly this law provided for the protection of watersheds of navigable streams and with the enactment of enabling State legislation to match dollar for dollar State money appropriated for the same purpose. A limitation of two million dollars per annum was set nationally as the federal government's share.

The Weeks Law very sensibly created the National Forest Reservation Commission composed of the Secretaries of War, Interior, and Agriculture, two members of the Senate and two members of the House of Representatives. These officials, all without additional salary compensation, were given powers to pass on the purchase of lands needed for watershed protection and fix the price thereof. Under this law such lands were added to and became part of the National Forest system. As indicating the activities of this Commission, it might be here stated that in 33 years, or up to the middle of 1944, this body approved 33,603 separate purchase transactions in the entire United States, involving a gross area of more than 19 million acres of forested lands throughout the nation.

When National Forest withdrawals were made, some of the counties in the Mountain and Plateau Region had a considerable volume of their area included as part of the withdrawals and, of course, such lands were thereby exempt from all forms of taxation. It was quite logical, therefore, that the Weeks Law should augment previous legislation on the matter and provide that twenty-five percent of all receipts collected for National Forest use would be returned from the U. S. Treasury to the counties in which land-use fees were earned, to compensate for the loss of this tax base.

The Act of March 4, 1913 provided that an additional ten percent of National Forest receipts should be used for construction and maintenance of roads and trails within National Forests, so that the State and counties now benefited by a total of thirty-five percent of all payments made by users for livestock pasturage, timber sales and other special uses of National Forest lands.

It was not until 1919 that the legislature granted authority to the State Board of Forestry to enter into contracts with the federal government, counties, municipalities and private land owners for fire and forestry protection and that year the reorganized State Forestry agency received \$3,500 Weeks Law funds. The continuing destructive brush, grain, and grass fires occurring in the rural sections emphasized the need for better fire protection and in 1920 ten regular, full-time, State Forest rangers were appointed, the area under State fire protection increasing from three and a half million to eight and a half million acres of combined State lands, unreserved federal lands, and private farming and wild lands.

Lumber Production

The lumber industry on private lands, in the National Forests, and in both the redwood belt and Sierra Nevada pine regions, was steadily progressing. From 1905 to 1920, inclusive, production of lumber in the redwood region maintained a fairly steady annual volume of 500 million board feet and this species of lumber, obtainable no other place in the world, was heavily exported. The bulk of the pine and other lumber species produced were used locally in the big demands for building materials in the fast-growing State.

The number of plants engaged in basic lumber industries fluctuated from year to year as small sawmills, shingle mills and similar ventures commenced operations, worked a year or two to fill some local demand, and then went out of business. The Bureau of the Census lists 253 of these establishments in California in 1910, a total of 209 in 1914, and 195 in 1919. According to the same authority, 15,087 wage earners in these industries were paid \$10,912,000 in 1914, and in 1919 some 16,950 workers earned \$22,489,000.

The State's total cut of lumber in 1909 is given as 1,143,000,000 board feet. This had increased to 1,263,000,000 board feet in 1910; to 1,303,000,000 board feet in 1914; dropped to 1,259,000,000 board feet in 1919, and jumped to 1,481,000,000 board feet in 1920. In the latter year, 168,130,000 pieces of lath, shingles and similar small wood products were also manufactured directly from raw forest materials.

National Forest timber sales accounted for 93 million board feet of timber for the years 1910 and 1911; over 220 million board feet in the period 1911 to 1915, and approximately 460 million board feet from 1916 to 1920, inclusive. In addition to stumpage sold, California farmers cut under free use on the National Forests almost seven million board feet of fence posts, poles, fuel, and similar forest products in 1909; eight million board feet in 1914, and five million board feet in 1920.

Based on the value of their first processing from the native tree growth, the official census takers gave California lumber production a value of \$18,276,000 in 1904; \$23,400,000 in 1909; \$22,973,000 in 1914, and \$47,311,000 in 1919. The boards cut from California forest trees in 1919 had almost three times the value of the gold dug from the California hills that same year. In the final process of manufacturing in that year of 1919, however, there must be added to the forty-seven million-odd dollars an additional thirty-seven million dollars, the total of eighty-five million dollars representing the value of both lumber used as such and finished products manufactured therefrom.

Tree Propagation

So much devastation of forest lands had previously occurred in California that it was quite natural for foresters to early turn their efforts to artificial tree propagation. For decades minor experiments had been conducted in an endeavor to establish coniferous tree growth on portions of the millions of acres of California's "watershed forests", covered with stands of such inferior trees as the different species of scrub oak and shrub growth like chamise, and manzanita. Particularly in Southern California, organizations and individuals had met with considerable success in planting forest tree growth in valley and near-valley areas from stock furnished by nurseries operated by public agencies or as private commercial enterprises. Those forest idealists who had visions of these scantily watered, brush protected slopes being covered with groves of giant forest trees were very much doomed to disappointment when planting experiments were conducted as relatively large scale operations.

Tree nurseries were established on a large scale basis by the United States Forest Service at Pilgrim Creek on the Shasta National Forest in 1912 and at Feather River on the Plumas National Forest in 1919, besides the State Nursery started at the State Agricultural College in 1917. Years before, however, many small nurseries were established by the federal Forest Service all over the State. As a matter of fact, almost every

ranger station in California at one time boasted of a small scale tree nursery, since both federal and state officers were vitally interested in any species of tree growth, whether forest or ornamental.

Before the first decade of the 20th Century had ended, forest officers reported the planting by seed or transplants of around 5,000 acres on the Southern California "chaparral" national forests. Tree planting is an exceedingly laborious and costly proposition and one can readily guess that this planting on such a large aggregate area was decidedly "extensive", rather than "intensive". Nevertheless, these early-day forest rangers did not spare themselves in an honest attempt to transform a considerable area of the Southern California mountain slopes into the tree-sized forests demanded by their local public.

Hundreds of civic and public-spirited organizations from various communities participated in forest tree planting work on the same type of brush-covered lands. Any and all species were planted, even though the official foresters doubted either their adaptability or their chances for survival. One enthusiast insisted that at least half a million acres of Southern California's watersheds were well adapted to the production of the Carob tree, a native of the eastern Mediterranean region, contending that it would prove not only a valuable watershed cover but a source of food and forage such as it produces on its native hills. The Carob experiments proved failures. Amateur foresters and conservationists proposed all sorts of crack-brained schemes of tree growth for wild lands, some of which had actually proven successful on a small scale in certain favored localities.

Even the Secretary of Agriculture himself became intensely interested in efforts to transform Southern California's scrub watershed forests into coniferous tree-clad slopes and after viewing a very successful plantation in another Western state insisted on heavier tree planting activities in California by the Forest Service. Investigation proved that the plantation which had so aroused the Department Chief's enthusiasm was located on a well favored area of 45 acres and had been sold at a figure of \$822 per acre. Even the most zealous tree planters balked at such a cost to the public pocketbook if the same measure of tree propagation were applied to the immense area of those California watersheds in an endeavor to make over the natural vegetation into commercial forests.

The 1912 report of the District Forester of the California Region summing up the results of tree planting in Southern California, contained the somewhat blunt statement: "When

in the distant future Forest Service historians chronicle planting in Southern California that particular chapter will, I fear, be cited as an excellent exposition of how not to do it." After ten years of struggle to coax full size species of trees to grow on the granite-underlaid soil of Southern California brush slopes, all the Forest Service had to show was a few scattered patches of knob-cone pine, more or less native to these areas as a companion to the brush and scrub oak, anyway, and a few eucalyptus groves on fragments of fertile land in particularly well adapted locations. Ranger stations, usually located on good land, were generally well stocked with thrifty tree growth.

After a joint field examination by the Chief of the Forest Service and local California officers, it was decided to abandon official coniferous tree planting on Southern California brush slopes entirely, although individuals and organizations were still allowed to carry on such work on public lands if done without cost to the public purse. By 1920 the only plantations on true mountain lands in the National Forests of California which could be called successful young artificial forests did not include more than 3,700 acres.

Better success rewarded the efforts of federal forest officers in the National Forests further north in the State, as well as in areas within that small portion of the true timber belt reaching down into Southern California. Forest Technicians E. I. Kotok, E. S. Munns and S. B. Shaw, after detailed investigations in the northern section reached the conclusion that due to the high costs of propagation as against natural reproduction, planting should be confined to small experimental areas and this policy was finally accepted.

Eucalyptus Fever

If native forest tree planting in California was somewhat of an indifferent success, the planting of shade and ornamental trees was quite the contrary. Leaving out trees which bear fruits and nuts, wherever there are fairly fertile lands in California, irrigated or blessed with a fair volume of precipitation and in fairly frost free areas, the most conspicuous tree growth adorning the landscape is the rows and groves of eucalyptus, or gum trees. This naturalized Australian forest monarch, which sheds its bark instead of its leaves, took as readily to a California environment as did the English rabbits to the Australian atmosphere. Although there are over 150 distinct species growing in the tree's native country and most of them have been propagated successfully in California, some half dozen members of the eucalyptus family constitute the greater number of those generally found in the State. Discarding their technical names, these are

the Blue Gum, Red Gum, Sugar Gum, Lemon Gum and Gray Gum. All these have decidedly different characteristics in their structure and appearance.

In their native haunts some species of these trees often reach an age of 400 to 500 years, heights of 300 to 400 feet, and a diameter of 12 to 15 feet. They are second in size only to the giant sequoias and redwoods of California among the big trees of the world. The successful propagation of eucalyptus in Santa Barbara County by Elwood Cooper in the sixties and seventies has been previously mentioned in these pages. Some of these original trees after a growth of 25 to 35 years, had reached a highth of 175 feet and a diameter of five or six feet. Under favorable conditions whole plantations had produced trees 65 feet high and five inches in diameter in four years from tiny seedlings. During the best period of the growing season trees were known to have made an average highth growth of five inches per day.

As well as being the leading lumber tree in the continent "down under", during the tree planting fever of the first decade of the 20th Century it looked for a time as though artificially-planted eucalyptus forests would even usurp orange groves and vineyards on some of California's most fertile lands. The tree was free from insect pests and diseases and had already proven its value for fuel and fence posts, besides furnishing windbreak and ornament on some of the most markedly-treeless areas of the State. Oil distilled from the leaves had also been established as having a high medicinal value. The red and sugar gum species were proven to have unusual lasting qualities and were being used in an experimental way by small California manufacturers for industrial needs normally filled by Eastern hardwoods.

Experiments in eucalyptus propagation was illustrated by the case of a 17-acre grove near Compton in Los Angeles County, planted in 1880. In 1900 it was cut over for the third time when it produced 1360 cords of wood for fuel, sold at \$2.60 per cord on the stump.

G. B. Lull, State Forester, was an eucalyptus enthusiast. Voicing a warning of the impending nation-wide timber shortage, Lull said:

"Fortunately for California and for the entire nation, it has been discovered that the wood of the rapid growing eucalyptus forms a substitute for Eastern hardwoods that is even superior to them. This fact had led to the establishment of immense plantations of this wonderful tree just at a time when Eastern competitions are disappearing from the market. What relief this remarkable genus may afford cannot now be more

than predicted. It promises to be the means of making California the home of large wood working industries and of causing this state to be even more prominent than the discovery of gold. It may mean eventually that the eucalyptus industry will be an even more fruitful source of revenue to the State of California than the orange industry has been."

Lull's successor in office, G. H. Homans, was but mildly enthusiastic about the possibilities of commercial eucalyptus culture, as were the officials of the United States Forest Service. An investigation launched by the latter in 1911, put somewhat of a damper on dreams of huge profits to be derived from large scale commercial eucalyptus production. The federal district forester pointed out that even with the most favorable growing conditions on the most fertile lands the best that could be expected from a ten-year old plantation was one hundred and sixty dollars worth of cordwood per acre, or an average annual return of sixteen dollars--a rather small income in comparison with the production of fruits, nuts, or grapes grown on similar lands.

Meanwhile, land promoters, ever on the alert for any new scheme to produce revenue for themselves through land sales, were not slow to take advantage of this new form of land use. Companies were organized which for a price of as low as \$250 an acre promised to plant eucalyptus groves and care for them for ten years. With even some forestry experts acclaiming the new timber producing venture as a coming Golconda, investors were not lacking.

Many thousands of acres of California lands were sold at high prices and, following the history of all land booms, a few people became richer while many trusting investors lost their all. The foresters who helped the eucalyptus land boom along were perfectly sincere in their optimistic faith in the future of this versatile, naturalized-Californian tree and cannot be criticized too severely. Neither they, nor perhaps anyone else, could foresee the wood substitutes and new fuels which would revolutionize the industries and marketing processes of California and of the world.

The use of highly producing California lands for growing eucalyptus could not stand in financial competition against the ever-expanding fruit and specialized farming uses; its wood, tough and resistant though it was, did not equal the qualities of the slower growing Eastern hardwoods; natural gas and other petroleum products were fast displacing wood as a leading fuel; and simple as its growing requirements were, not all lands would produce the heavy timber harvest obtained from groves on favored sites.

The eucalyptus is a wonderful tree and has taken its definite place in California land use. As an adjunct to other types of farming it has brought into being woodlots on farms formerly treeless, furnishing fuel, posts, and other farm timbers. For windbreaks it has no superior and as such stands guardian to valuable orchards and fruit lands while itself occupying a minimum of space. It profitably occupies waste spaces found on almost any tract of land devoted to diversified farming use. Its aesthetic value on much of the California landscape normally treeless cannot be overestimated. With advancing scientific discoveries in new uses for wood and plastics derived therefrom, some day perhaps eucalyptus forests may play a more leading part in California rural land use.

Travel and Trees

It is a trite saying that there is more than lumber in trees. We have noted the great increase of visitors to California's National Parks where trees were preserved purely for their aesthetic value; we have also noted that when a majestic forest tree with its sister trees provided shade and relaxation for thousands of people each year in the public forests, that tree was spared from the woodsman's axe.

The recreation problem on the National Forests was decidedly different from that in the National Parks, since in the former, large areas of national outdoor magnificence did not exist and public recreational use must be melded with other legitimate uses of the National Forests. Moreover, while angling was an open sport in the National Parks, all forms of wildlife were carefully preserved in these great outdoor wonderlands. There is no question concerning the wisdom of this policy since it would be rather dangerous to have people shooting and lead flying all over the place in such areas; but with more public lands passing into private ownership public shooting grounds became a national need, and the National Forests offered about the only areas open for the millions of the nation's nimrods.

Free public campgrounds where the masses of the citizens could enjoy their outings for a few hours, days or weeks, and hunt, fish or otherwise derive recreation from the public wild lands, began to feature National Forest administration. In the location and construction of these public campgrounds, the Forest Service emulated the policy of the National Park Service in preserving aesthetic values and while providing water, sanitation and other conveniences for the camping public, disturbed the natural surroundings as little as possible.

It might be said that although public recreation represented the leading and almost exclusive use of National Parks and but

an incidental use of the National Forests, that the Forest Service for a time built even bigger public camps for the use of the ordinary citizens than did the Park Service. Possibly this was partly because elaborate hostelrys, representing huge investments, quickly came into existence in the National Parks and camping in the rough, if strongly encouraged, would have the effect of cutting down the patronage of these high-priced resorts.

The Forest Service had a dual purpose in the location and construction of public campgrounds. Concentration of campers in specially-prepared, fire-proofed areas represented a lesser degree of water pollution and of fire risk than by having these thousands of campers scattered here and there throughout the forests. In campground construction also the Forest Service had need always to keep in mind its own multiple land use policy and plan its recreational program accordingly.

Pure water, the first need of campers, had to be developed for many of the public camps. Usually, water systems for public camps were designed also to provide water for fire-fighting use, for grazing, and possibly for irrigation farther down the line. Many of the Forest Service camps were merely small areas in the back country made safe from a fire risk standpoint and equipped with rude fireplaces and a table or two. Some of them located adjacent to heavily traveled roads were developed to accommodate many thousands of people annually.

By 1920 both the Park Service and the Forest Service had foreseen the fact that outdoor recreation was slated to become a leading national and California land use and were making plans for the coming decades which were to witness California's highways lined with automobiles carrying this type of land user. Although the Forest Service had not the facilities for checking recreation travel possessed by the Park Service, a conservative estimate of the number of people using the National Forests of California for recreation purposes in that year of 1920 is placed at 707,500.

Up and down the State also, besides public land areas visited by tourists and travelers, were many private resorts becoming nationally and internationally known for their extent, uniqueness, and the quality of waters from the springs to which they often owed their existence. California, from Oregon to Mexico, is more than ordinarily blessed with hot springs and mineral springs, the curative properties of many of which were well known to local Indian tribes for centuries before the coming of the white man. Some of them, such as The Geysers in Sonoma County, had been popular with American travelers since the seventies. The waters of other California springs such as Napa, Shasta, Bartlett, Vichy, Aetna, Calistoga, Gilroy, Paso Robles and Arrowhead, were beginning to rank in popularity and use with those of the most famous spas of Europe.

This increasing recreational use of land in California, coupled with companion demands of industrial and agricultural interests, was an incentive to highway development in the State. An added factor, of course, was the increasing use of the auto and the almost unlimited local supplies of gasoline available for its operation.

California can be justly proud of the well-laid plan which has given her one of the finest public highway systems found anywhere in the world. This is especially remarkable in view of the fact that the basic plans for the system were made in the days when the modern auto was merely an idea in the brains of Ford, Chrysler and other automotive power pioneers.

When the California Bureau of Highways was created by law in 1895, Governor James H. Budd appointed a commission of three men to compile statistical data covering mileage and conditions of roads in each county. They were to make a detailed and exhaustive survey of road needs from a combined local and State-wide standpoint and to assemble data on the topographic features of each county, including deposits of road-building material, availability of water for "road sprinkling" purposes, and other factors.

The members of this road commission did not spare themselves and during 1895 and 1896, by means of horse and buggy travel, traversed thousands of miles of mountain, desert and valley roads in all sorts of weather. Their report to the governor recommended a State highway system that was thorough and complete in all details. When the report was made public, the San Francisco Call quoted one of the members of the commission as saying, "It is the intention of the Bureau to see that a finely macadamized highway is built from one end of the State to the other".

Legislation abolished the State Bureau of Highways in 1897 and created the new Department of Highways. County road building progressively continued but during the period 1895 to 1909 there was no highway construction as a State enterprise, and nothing but the assertion of plans of the old bureau before it was wiped out of existence.

California's petroleum was coming to the fore with vast quantities of the new fuel, and autos were becoming the popular mode of travel. In addition, the large California ranches and great distances emphasized the need of better roads and the services of an active State highway organization. By Act of March 22, 1909, the State Highway Commission came into being. The following year the voters of the State ratified this action of their legislature. This referendum vote of 1910 also authorized a highway bond issue of eighteen million dollars, a tremendous figure at that time.

Backed by adequate funds and the people's desire for a good road system, the State Highway Commission soon swung into action. Like their predecessors of the old Bureau of Roads, they traveled over the State's terrain, visiting every nook and corner of California to ferret out highway construction needs and work out plans for the priority of projects lined up in horse and buggy days.

The first master plan called for main highways through the Interior Valley Region and along the Coast, traversing the State north and south, with laterals joining all county seats with main highways. This was a tremendous job but the people of California demanded good roads, voicing their desire with a popular vote in 1916 by which a second bond issue placed an additional fifteen million dollars at the disposal of the State Highway Commission. A third bond issue of still forty million dollars more was authorized by the voters in 1919, the intent of this last issue being to complete the then planned State highway system of 6,700 miles.

The public were getting their money's worth in the matter of roads. Good planning and management marked highway construction throughout California and the funds provided by the State's own bond issues were stretched out by the cooperation of counties and cities building modern highways to join up with the State system and become a part of it.

On federal lands within the National Parks, National Forests and on public domain, the United States Bureau of Public Roads carried on an independent program of high class road construction, their projects later being turned over to the State as part of the latter's system. Since most of the federal Bureau's work lay in the rugged mountain sections, theirs was a stupendous task. The result, however, was that their projects usually opened up markets for the agriculturists of hitherto isolated valleys. It is a fact that until the era of road building came, the only industrious or social intercourse some populous mountain communities had with the outside world was by pack trail, or by the almost equally backward transportation system of precipitous roads built in ox-cart days.

A lot of road building was decentralized in the hands of the counties and the Forest Service and Park Service themselves provided secondary road systems involved in projects costing less than \$5,000 a mile. On some back country projects, the versatile forest ranger more than contributed his quota. Leaving their homes and families during the winter months crews of permanent forest officers with hand and horse labor carved roads over steep, rocky hills to provide better public transportation and access to forest fires in isolated region. California almost to a man was determined to have more and better roads both in the populous areas and in the back country, and by 1920 the road-building era was well under way.

As tourist travel by auto increased, California was reaching out for something to offer not found elsewhere in the world or the nation. After all, the Yellowstone Park further north could be substituted for the mountain wonderland of the Yosemite, and Florida offered a parallel combination of orange groves, palm trees and exotic beaches. No area anywhere, however, could duplicate California's famous redwood forest belt covering a million and a half acres stretching in a 450-mile strip through the Central and North Coast Regions.

A scenic highway through these groves of magnificent trees might serve the dual purpose of presenting to the traveling public an "entirely different America" and the rousing of public interest in the matter of better protection for this All-American tree. Practically every acre of redwood lands was in private ownership, and the shame of the passing of these lands has already been recounted. The Redwood Highway took high priority in the State Highway system plans and when a move was made to preserve a part of these magnificent groves for posterity, it met with unanimous approval from the highest official in the nation, down to the man on the street.

When the move was launched, ex-president Theodore Roosevelt said: "I appeal to you to save these mighty trees, these wonderful monuments of beauty". Edwin Markham wrote concerning the redwoods: "The great trees belong to the silences and the millenniums. Many of them have seen more than a hundred of our human generations rise, give out their little clamors and perish. They chide our pettiness, they rebuke our impiety. They seem indeed, to be forms of immortality standing here among the transitory shapes of time".

Inspirational feeling for the redwoods and a desire to save them as much as possible from further exploitation were not lacking but this feeling was transformed into practical action when the "Save The Redwoods League" was organized in 1918, and formally incorporated as a non-profit organization in October 1920. Newton B. Drury was the secretary and moving spirit of the organization from its inception until called into a broader field of action as head of the United States Park Service two decades later.

Save The Redwoods League had for its objects: (1) To rescue from destruction, for the enjoyment of this generation and those to come, representative areas of our primeval forests; (2) To establish through federal aid a national redwood park and through State aid a state redwood park; (3) To purchase redwood groves by private subscription, and to establish memorial groves for individuals and organizations; (4) to obtain the protection of timber along State highways in California, particularly to preserve the beauty of the celebrated Redwood Highway, and (5) To support the reforestation and conservation of our forest areas.

No donation was too large for Drury and his associates of the League to handle; no contribution was too small for them to gratefully accept. Types of membership in Save the Redwoods League ranged all the way from that of founder and associate founder at \$5,000 and \$2,500, respectively, down to annual members at \$2.00 per annum, and junior members of fifty cents a year. Widespread publicity campaigns soon resulted in generous donations and a large membership in this movement to save the redwood trees, which John C. Merriam, later president of the organization, said was one of the biggest conservation moves in California's history.

Inflammable Lands

Increased travel in the California mountains was imposing new forest fire hazard problems on the federal foresters. In addition to the annually-recurring, expected forest fires caused by lightning, man-caused fires were keeping the forest rangers busy. Thousands of people from all walks of life were wrestling their Model-T Fords over back country roads in a vast territory which in the driest months of the years was virtually a huge tinder box, and which a few years previously had known the presence of only an occasional cowpuncher, shepherd, woodcutter or prospector.

Wherever human beings congregate there is fire danger and the greater the concentration, the greater the degree of fire hazard represented. Grain fields, grassy slopes, brush lands, and the dry summer cover of the forest floor presented an open invitation to discarded burning tobacco, the carelessly tossed match, the unextinguished or improperly handled camp fire, or the hot blast from a motor's exhaust, for the initial start of a disastrous conflagration. In the dry California hills, sparks struck from a rock by a passing wagon wheel or horse's shoe have even been known to start fires during hazardous periods.

The Forest Service, lacking man power commensurate with this increased risk, was forced to meet the situation by developing new methods of fire prevention and fire-fighting technique. For a period of seven or eight years the forest rangers worked under a policy which recognized "allowed to burn" fires, that is, they devoted their energies to stopping fires in the most hazardous locations and where prime timberlands or other high values were at stake, to the neglect of fires threatening lands of low caliber value, or burning in areas of lesser hazard. This policy was abandoned in 1919 due to potentially safe fires, through neglect of attention when small, later reaching devastating proportions.

Coert DuBois, district forester of the California Region, in 1914 introduced large-scale fire fighting methods by importing

trainloads of fire-fighters to battle a fire near the foot of Mt. Shasta. This theory of massed forces was sound enough had the man power been backed up with sufficient trained overhead, messing facilities, and fire-fighting equipment. DuBois agreed with his fellow foresters that funds were wasted on this fire because these facilities were lacking. The federal Forest Service then commenced organizing on a basis whereby advance plans were made for food supplies, fire-fighting equipment, and transportation to move and properly maintain fire-fighters recruited from the nearest available man power sources. About the same time, the policy was also set up that the taxpayers were to receive full value in resources saved for every dollar spent in forest fire suppression.

S. B. Shaw completed his first series of technical fire studies by early 1919 and the factual data obtained by him and his associates from an analysis of thousands of previous California fires, in all types of conditions, uncovered various weaknesses in fire prevention and fire suppression techniques. This factual data, worked up into handbooks, was used to develop practices to supplement the judgment of the ranger in charge of any particular fire, as well as to plug up weaknesses in fire-fighting tactics.

While each forest fire was in itself an individual problem, certain fundamentals applicable to all were utilized by the forest officers. Two standby slogans current among rangers and guards in the California forests somewhat epitomize the spirit animating these rural firemen--"Hit them while they're small", and "A fire is never safe till it's out". Incidentally, while large, spectacular fires are always headline news, the thousands of fires annually occurring in California's forests and rural districts, extinguished while small and most of them incipient conflagrations, rarely come to the public notice.

A great many California residents shared the opinion of the large timberland owner, formerly quoted, that it was a "hopeless, endless job to fight forest fires". Old residents had become so accustomed to seeing fires sweep the grainfields and wild lands that such fires were often accepted as a matter of course and a necessary evil to be endured. About the second decade of the 20th Century, the light burning theory had many advocates.

Although hardly willing to return to the days of vast, uncontrolled fires, these "light burners" argued that if the forest floor was lightly burned over every year or so it would reduce inflammable litter on the ground, thus leaving a lighter ground cover to create a hot fire during the dry summer months. Many exponents of this theory were influenced by the selfish

motive that these light fires would also result in a more lush forage crop for their flocks and herds the following year; others had no personal axe to grind and were quite sincere in their belief in "light burning" as a sound forest fire protection measure.

The light burners argued so long and loud that in 1916 the Forest Service met their challenge. Forest officers themselves used fire to fight fire and used it freely in clearing up inflammable debris, but they also had very definite doubts as to the efficacy of fire as a prevention agent when employed in large scale burning of virgin forest areas. They set forth that they were willing to allow burning under closely supervised restrictions if it was to clear agricultural lands, to protect homes and property, to facilitate the handling of a livestock business, or to aid in systematic mineral prospecting. For all these purposes and wherever fire could be used as a prevention agency, a definite system was worked out with the State Forestry agency and has since become standardized practice.

This liberalizing and legalizing of the use of fire on wild lands was not what the ardent advocates of light burning wanted at all--particularly the livestock grazers. The idea of this type of land user was broadcast burning of timbered areas and brush fields to facilitate livestock movements and to perhaps replace young pine trees with annual grasses and forage plants.

Through the ensuing years the controversy raged, many State and national leaders taking up the cudgel in favor of the "light burners". Forest officers, while disbelieving in the practice either as forage betterment or timber protection, were quite willing by impartial experiment to have their theories proven wrong. Fairly large scale experiments were, therefore, undertaken in widely scattered locations, on various types of wild lands. While there are Californians who still believe that current burning of the forest floor is a good fire prevention practice, the thorough-going experiments conducted throughout the years have proven the light burning theory entirely wrong when applied to California mountain lands.

It was found that when areas were safe to burn from the standpoint of little or no jeopardy to valuable timber and adjacent man-made improvements, set fires would automatically die out. When the ground cover would burn, a regular fire-fighting organization was necessary to prevent damage of a volume greater than the basic value of the area itself to which the burning was to be confined. Controlled fires on timberland, hot enough to consume the ground litter, also destroyed the young trees which formed the nucleus of future forests.

Wide experiments further confirmed the fact that instead of clearing the ground of inflammable litter, another litter of the same nature was deposited on the forest floor as the ground fire brought to earth needles and twigs from the young trees, and these when they later dried out formed a ground cover with just about the same degree of hazard as prevailed on the area before burning. Dense brushfields could generally not be burned unless a fire of sufficient intensity to constitute a threat to surrounding areas was generated; moreover, the young timber growth pushing its way through the brush in many localities and by such process gradually replacing the worthless brushfields with timber growth, was also consumed by such a fire.

One of the biggest arguments which the experimenters found against the so-called "controlled" or "light burning" of forest lands was its prohibitive cost as compared to the conservationists' method of keeping fire out entirely, so far as possible. It was found that controlled burning must be followed by still more burning year after year, adding to the excessive original costs, greater many times over than the standardized fire protection now being given public forested lands. Under the average organized fire protection system, a forest area might be expected to burn over, on the average, once in one hundred to two hundred years.

As for the improvement of forage on a burned-over area, although grazing conditions were somewhat bettered for a year or two following a fire, it was proven that the fire destroyed the natural forage and its propagating system and the native plants were replaced with growth of low forage value. Although still using fire as a prevention agency, most of the private timberland owners of California, after decades of experiment, have agreed with the federal and state agencies that the policy of keeping fire out of forest lands as much as possible is by far a better method than any system of broadcast burning.

As the lumber industry of the nation pushed towards the Pacific Coast, private timberland owners paid somewhat more attention to the factor of fire protection for their lands. Admitting the unfeasibility, and often the impossibility, of controlling fire on their lands, and the State law holding them liable should fire escape to other lands, during the second decade of the 20th Century many of the private land owners having holdings within or adjoining the National Forests, turned them over to the Forest Service for protection.

These absent owners paid into a special fund a sum based on the average cost per acre for fire protection on National Forest lands to which their own were contiguous. As the fire menace

reached greater proportions in rural California due to increased population and land use, State laws made timberland fire protection compulsory and these laws were usually backed up by similar ordinances passed by the various counties. Because of the complex pattern of private land ownership as intermingled with public lands, the federal and state governments eventually adopted a policy of fighting all uncontrolled fires regardless of location, within the zone of their respective responsibility.

Mineral Development

The total mineral production in California for 1910 is given as \$86,294,000. The broadening of the mining field generally and the great expansion of the oil industry had raised this figure to \$242,100,000 in 1920. The production of yellow gold itself tumbled from a total of \$19,715,000 in 1910 to \$14,311,000 in 1920.

World War demands in 1916-1918 made those three years the peak of the copper mining industry, the output of that metal being valued at \$13,729,000 in 1916; almost the same in 1917; \$11,805,000 in 1918; with a drop to \$4,122,000 in 1919, and a further decline the following year to \$2,382,000.

Silver reached a high mark of \$1,859,000 in 1920 while quicksilver had its peak year in 1918, with a valued production of \$2,579,000. Tungsten reached its high mark production figures in the World War years also, the highest annual output being \$4,571,000 in 1916. The valued production of tungsten in 1906 had been \$189,000, and its production following World War No. I had sunk so low that it was not even included as a separate item in the California mining statistics for 1920.

Lead reached its highest production figure in 1917 when the output was valued at \$1,862,000. Zinc, previously a relatively unimportant California mineral, reached a production figure of \$2,137,000 in 1916, and \$1,209,000 in 1917. The total output of chromite which was rated at less than \$3,000 in 1906, was valued at \$3,649,000 in 1918, but following the first world war dropped again to an annual production of a few thousand dollars.

Between 1906 and 1920, the production of industrial minerals, including such materials as pottery clay, diatomaceous earth, pyrites, limestone and mineral water, more than doubled. The State Division of Mines valued the output of this class of minerals at \$1,558,776 in 1906, and at \$3,583,000 in 1920. In that year the leaders of the seventeen industrial minerals listed by the State authorities were diatomite, \$1,056,000; pottery clay, \$440,000; pyrites, \$530,000, and mineral waters, \$421,000.

The production of minerals classed as salines, embracing borates, potash, salts and soda, climbed from a production valued at \$1,413,638 in 1906, to \$6,505,000 in 1920. The California desert country was yielding heavily in the class of materials native to that environment and the annual output of borates and soda alone increased in value from \$1,747,000 in 1915 to \$3,959,000 in 1920.

The immense amount of building in California greatly augmented the production of structural materials including cement, lime, granite, marble, and miscellaneous building stone. The value of \$7,606,000 given for such production in 1906 had increased to \$29,680,000 for the year of 1920. Cement was easily the leader in this class and practically all of the entire State output was used locally, a boon alike to the irrigation farmer, the street and highway engineer, and the urban building contractor. In the production of this versatile building material seven modern plants in California turned out 5,453,193 barrels in 1910, with a rated value of \$7,485,715. In 1920 a total of nine plants in the State processed 6,709,160 barrels of cement, with a manufactured value of \$14,962,945.

Black Gold

All other mineral production shrunk into relative insignificance when compared to California's "black gold", as the magnitude of the State's petroleum industry continued to increase by leaps and bounds. In 1906, California's oil output totaled 32,624,000 barrels and many well informed mineralogists thought that this ocean of oil represented her ultimate in production. Five years later California lands produced 77,697,000 barrels. In 1915 production had dropped from a larger volume for the two preceding years to 91,146,000 barrels. In 1920 California pumped from her oil wells 103,377,000 barrels of the valuable fluid.

Actual pumping was unnecessary in some cases where reservoirs far beneath the ground were tapped and gas pressure produced a geyser of oil, the main problem in connection with which was controlling the flow until the gas pressure was reduced. Prices of crude oil fluctuated as the volume on hand increased or diminished, or competing companies forced prices down. The output of 1906 was valued by the State Mining Bureau at \$9,238,000; that of 1910 at \$37,689,000; the 1915 volume at \$43,503,000, and the 1920 production at \$178,394,000--figures undreamed of in the palmiest days of the gold rush.

The Santa Maria field in northern Santa Barbara County made its debut as an oil producing center in 1907 placing that county--where much of the original petroleum development in California took place--among the leading producing centers of the State.

Nine counties in the southern section of the State were now engaged in petroleum production. These were Fresno, Kern, Los Angeles, Santa Barbara, Ventura, San Luis Obispo, Santa Clara and San Mateo. The last three named produced a relatively small amount. Without the spectacular gushers of other fields, Los Angeles County continued to lead the other California counties in oil production.

Oil mining has always been more of a gamble than gold mining. Money flowed freely in the hectic communities of the oil producing centers. Wages were high in the petroleum industry, which called for a high percentage of specialists. Some of these were dare-devil technicians, expert at such dangerous jobs as capping flaming oil gushers.

A few people became rich, a larger number were rewarded with a fair competence. Oil stocks, based on potential fields or individual wells, flooded the State and nation, and many small investors lost their lifetime savings through backing some wild cat oil drilling venture.

The larger companies paid consistently fair dividends but not large enough to attract the speculative, gambling type of investor. These large companies, such as Standard, Union and Shell, built up immense reserve funds so that they were able without financial strain to absorb a considerable volume of wild-catting ventures of their own. The big concerns gradually monopolized the industry.

It is said that business and professional men of the City of Bakersfield, already close to a proven oil field, refused to contribute a dollar to independent oil promoters along Kern River and whose efforts were later rewarded by almost fabulously rich wells. In 1910 the board of directors of a concern drilling in the Maricopa District instructed their superintendent to cease drilling operations on a certain hole when a depth of 2,500 feet was reached without striking oil. Contrary to orders, the superintendent kept on drilling and at a little greater depth the Lakeview well came in with a roar heard for miles around, the gush of oil shooting the half-ton bailer out of the well to the top of the derrick. This famous well produced as high as 70,000 barrels of oil per day and averaged 42,000 barrels a day till it stopped flowing two years later. A single well in the Coalinga District, called Sour Dough, by the end of 1910 had paid \$517,303.50 in dividends.

Many sections of rural California were greatly benefited by the companion product of petroleum, natural gas. While the bulk of this outstanding native fuel found its market in urban centers, farms along the route of the pipe lines conveying it, shared in its use as did scores of rural-urban communities.

In 1906 the production of natural gas was 168,175,000 cubic feet, with a valuation of \$109,489. Five years later the volume had risen to five billion cubic feet, valued at close to three million dollars.

In 1916 the natural gas piped to consumers in California totaled well over twenty-eight billion cubic feet, valued at close to three million dollars. In 1920 this blessing to the housewife and boon to California's industrial world had reached an output volume of 58,567,000,000 cubic feet, and large-scale production had cut the unit price of this labor-saving product almost in half, the production value that year being given as \$4,898,286.

Fortunately for the public purse and present day America, the federal government was more farseeing in connection with the handling of potential oil deposits than it had been with other natural resources of the State. In 1910 one and one-half million acres of potential oil lands were withdrawn from settlement and entry and the later land laws, for instance, the act of July 17, 1914, while allowing filing on lands such as those with a semblance of agricultural possibilities, reserved to the United States all potash, phosphate, oil, gas and asphaltic minerals which lay beneath such lands. And about the time of the passage of this same law, an obscure official of the General Land Office, examining old land titles, found that on a considerable area of the millions of acres given by the government to the Southern Pacific Company, "mineral rights" had been reserved--and oil was the leading item in California's mineral inventory.

California Wildlife

While the bald hills were belching up their black liquid wealth, deserts yielding their phosphates and sodas, and the forests their wood supplies, the organization charged with the management of the State's wildlife resources existing on these same wild lands were endeavoring to strike some sort of a balance between the demands of a prosperous population and the remaining supply of wildlife. With increasing road mileage and greater use of the automobile, hunting and fishing were becoming more popular sports year by year. Many species of game were becoming alarmingly scarce and some were entirely extinct. Until well past the turn of the 20th Century, although the California State Fish and Game Commission had already done a wonderful work in propagation of fish, there was little control over the man with the gun. Bag limits were practically non-existent, and hunting in general free as the mountain air.

During the State's formative years, settlers were wont to augment their meat supply by taking wild game when and where

they pleased, and the hide of the species taken was never an article to be despised. In addition to the fur taken by amateur and professional trappers, tanned deer hide was a staple article of commerce and used extensively in making belt lacings, pouches, certain kinds of clothing and gloves.

Up until 1900, or later, gloves were from material other than buckskin were rarely seen in rural California. Deer were killed by the thousands to supply this commodity and the term "hide-hunters", used throughout the Mountain and Plateau Region of the State, came to mean not only those who gained their entire livelihood by the slaughter of deer, but settlers who engaged in the occupation to supplement their farm incomes. As a side issue, the choicest parts of the meat were sometimes sold to construction and mining camps. Hunters sometimes actually contracted to keep certain establishments supplied with venison the year around, much in the same manner as the buffalo hunters of the plains.

The first forest rangers in Trinity County, around 1908, assembled data on the early deer kill in their area as follows: Up to 1895 ten settlers of the Mad River District in that county had killed around 82,000 deer, some of them employing Indian hunters who used the bow and arrow method to help the local farmers harvest the wildlife crop. Thirty settlers in the same region killed an average of 100 deer each, every year between 1880 and 1895. One hunter in that county killed 2,000 deer in a single fall and winter season. Two men hunting in the same general area in 1890 killed and skinned sixty-five deer in one half day. At Weaverville, the Trinity County seat, deer hams, usually the only part of the animal saved for meat, retailed for \$1.00 each regardless of size.

In the extreme northeastern part of the State where the much larger Rocky Mountain mule deer ranged, two young brothers around the turn of the century killed 1,200 deer in a winter's hunting. Hide hunters from Oregon operated extensively in that section. When legislation placed deer hunting under control, a criminal element from that neighboring state still engaged in illegal hunting in the isolated areas of Modoc County and it was not till 1912 that the last gang of them was broken up by a fearless game warden and local forest rangers.

The days of free hunting were ended in 1907 when the State Legislature passed the Hunting License Act. The license cost one dollar per annum for a citizen of California, more for non-residents and aliens, and as indicative of the number of hunters, the revenue the first year from 113,975 licenses sold amounted to \$118,427. In 1910 a total of 124,421 hunting licenses were sold.

Angling was free to Californians until 1914 when every adult fisherman was required to have a State license and 81,000 licenses were sold that year. In 1920 a total of 218,000 hunting licenses and 162,000 angling licenses were sold in California.

In that same year of 1920, 5,269 commercial fishing licenses were sold by the State. Commercial fishing, mainly off the sea coast, was adding large sums to California's annual income, and that sportsmen were also getting their money's worth is evidenced by the fact that in 1911 the State fish hatchery at Mt. Shasta alone produced fifty million salmon and seven million trout eggs.

Generally speaking, the hand of the farmer was against the hunter and fisherman. Both to advise and assist the State fish and game protection and propagation agency and to endeavor to effect spotted truces with the rural land owner, sportsmen's organizations--anglers' clubs, shooting clubs and fish and game protective leagues--increased in numbers, their members being mainly urban residents.

In spite of the fact that the membership of these organizations was pretty well diluted with a class of hunters and fishermen who were by no means sportsmen, these leagues and clubs, dedicated in theory at least to a program of conservation, really did a good deal for the betterment of hunting and fishing conditions in California. In the aggregate they were sufficiently strong in numbers to exercise a considerable influence on legislation, invariably tardy in matters affecting wildlife welfare. Problems in connection with the proper use of these resources of the State were annually growing in number and complexity, as the sport of hunting and angling continued to be greatly augmented by the increasing use of the automobile.

The presence of the sea otter, the fur of which is probably the most valuable known, was one of the first factors which attracted the attention of the outside world to California. The value of sea otter fur greatly outranked that of the beaver of the mountains and brought a fancy price in European markets even as far back as the Eighteenth Century, when the California coast was one of the main breeding grounds of the animal. In 1891 the average price for sea otter skins in the London market was \$285. In 1903 at the same place, prices ranged from \$40 to \$1,000 each, with extra large pelts bringing in as much as \$1,125. In 1917 otter skins, confiscated by federal officials, sold for an average of \$689.70 each in the local fur market.

Although 100 years previously a Spanish governor of California, even then sensing the impending doom of this fine fur-bearer, had issued an edict against the sale of sea otter skins, it was not until 1913 that the few remaining animals received legal protection. As further illustrating the slowness of legislative action in the protection of wildlife, it was not until 1913 that any legal limit was set on the number of band-tailed pigeons that a hunter could kill, although this bird was rapidly disappearing from his native haunts from over-hunting.

The great grizzly bear was gone--his passing, as a measure of protection to human life and property, probably fully justified. The prong-horned antelope and native elk had almost all been exterminated by hunting. When Surprise Valley, Modoc County, was settled in 1864-66, prairie chickens were found in abundance there, as well as in some other sections of the State. This fine game bird was now extinct in California. Sage grouse, leading upland game bird, was threatened with extinction as was also the great California condor, which though not a game bird, was the largest bird on the North American continent.

In 1912 in the markets of San Francisco alone, over 300,000 wild ducks were sold; and in 1920 a California hunter in a single day could legally kill two 200-pound Rocky Mountain mule deer bucks and in the later open shore bird season eight 15-pound wild geese, and twenty-five large mallard ducks.

The State Fish and Game Commission, the California Academy of Sciences, federal agencies dealing with wildlife problems, and some private organizations, were all making heroic efforts towards wildlife conservation. Even the practical-minded firm of Miller and Lux provided special protection on their lands for the California elk, largest of native game animals and which were so plentiful in early days. California owes a debt of gratitude to such men as John P. Babcock and Chas. A. Vogelsang of the Fish and Game Commission, and J. Hall McAllister of the Academy of Sciences, for their pioneer work in fish and game protection.

In 1914 and 1915 the Academy of sciences captured and shipped to different locations a total of 146 elk to form the nucleus of new herds. The same agency cooperated with the Forest Service and State Commission in the winter feeding of the small remnant of prong-horned antelope still existing in the northern section of the Mountain and Plateau Region. Through these joint efforts and the work of the Biological Survey in neighboring Western Nevada, these antelope had so increased in numbers that some twenty years later their legal hunting was again allowed.

Forest rangers, park rangers, and game wardens were jealously guarding beaver colonies in various mountain sections and this interesting furbearer, so intimately connected with the history of Western conquest, was carrying on sometimes within a stone's throw of modern highways and whizzing automobiles.

With such a large area of wild lands and comparatively few official guardians, it was quite natural that the genus of hunter or fisherman known in common parlance as the "game hog", was by no means a rarity. More and more private lands were being posted against hunting and fishing, as farmers, along with game wardens and rangers, were often unable to distinguish between hunters and fishermen and "sportsmen"--both classes alike in the eyes of the law.

Nature herself maintains a balance on lands in their natural state. When this balance is disturbed by human occupancy or use, some reparation must be made if the lands concerned are to continue to play their proper part in the general economic structure of civilization. Predatory animal control became necessary when men killed off the deer which were the natural prey of the predators. In a sense the hunter was taking the place of the predatory animal in harvesting the deer crop.

It was found by special studies carried on between 1910 and 1913 that besides the toll he took of calves, colts and sheep, the average adult mountain lion killed at least fifty deer annually and in the aggregate, took a heavier toll of the deer population than all the hunters of the State. The State, therefore, placed a heavy bounty on this king of predators.

While some mountain lions were killed by private hunters and trappers, the animal took the place of the grizzly bear as the official foe of game conservationists. Jay Bruce, official State lion hunter for many years, killed hundreds of mountain lions all over the State and by his skill and prowess, emblazoned his name among those of the famous grizzly bear hunters of an earlier era.

Wildcats took a heavy toll of nesting upland birds but since their hides made fairly valuable fur, their numbers were materially kept down by hunters and trappers. The native coyote, fur-bearer and predator alike, was listed as one of the worst enemies of game as well as of domestic stock. Almost every county in the State placed a bounty on his scalp, and extermination campaigns were waged against him by both state and federal agencies. The toll taken by the coyote of sheepmen's flocks was enormous and represented one of the biggest hazards of that branch of the livestock business. Sheepmen's organizations levied assessments on their membership and added funds so collected to the war chest of the official campaign against the coyote.

This versatile predator of the California ranges is not at all choosy in his diet and when wild game is scarce turns his attention to farmers' flocks and poultry yards. He can subsist on offal or carrion just as readily as on fresh cottontail rabbit, venison, lamb or turkey. Through the years he has met every challenge of rural civilization, changing his habits to fit the needs of changing conditions. In spite of every man's hand being against him, his kind are still plentiful at the present time, ranging from the foothill citrus groves of the south to the great sagebrush expanses of the extreme north.

In 1915 and 1916, an outbreak of rabies among coyotes in Western Nevada spread into the thinly populated extreme northern counties, and represented a real menace to stockmen. Coyotes, afflicted with the disease, ran amuck, entering farmyards and even village streets in broad daylight. The disease was transmitted to dogs and further spread among livestock by the domestic canines.

Strict quarantine measures were applied and in Modoc County alone federal and state agencies for months employed a force of paid hunters who trapped, poisoned and shot coyotes by the thousands, as well as loose domestic dogs and cats. Several thousand head of cattle, horses and sheep were lost.

The lives of a considerable number of people bitten by rabid animals were saved by prompt Pasteur treatment, one of these being a three-year old son of a forest ranger, badly bitten and clawed by a large rabid wildcat which, boldly entering a mountain town, attacked the child on the porch of his own home. At least one farmer died of the disease.

The Forest Service was quite naturally very much interested in wildlife as part of their program of conservation. The position of the versatile forest ranger was clearly stated by the Chief of the Bureau, Henry S. Graves, when he publicly expressed the responsibilities of the organization in this respect as follows:

"Forests are more than trees. They are rather land areas on which are associated various forms of plant and animal life. The forester must deal with all. Wildlife is essentially and legitimately a part of his care as are water, wood and forage. Forest administration should be planned with a view to realizing all possible benefits from the land areas handled. It should take account of their indirect value for recreation and health as well as their value for the production of saleable material; and of their production of meat, hides and furs of all kinds as well as for the production of wood and the protection of water supplies....

"Wildlife is largely a forest product. It should be regarded as a forest resource, to be protected and systematically developed. It is a resource which is easily destroyed under abuse; but it readily responds to right treatment. The intelligent fostering of the valuable wildlife of the forest is and always has been one of the objects of forestry."

An added factor contributing to the protection of California fish and game was the Forest Service requirement that each of its rangers become an unpaid State game warden as one of his regular duties. Thus the force of State wildlife guardians was greatly augmented. The forest ranger, federally employed and paid, was both a State game and a State fire warden. Through the years, in the enforcement of the State game laws, forest officers have faced and even met death itself in the performance of these--in a sense--volunteer duties.

A State Conservation Commission of three persons was created by law in April 1911. This commission, appointed by the governor to serve at his pleasure, was charged with the responsibility of gathering information concerning forestry, water, the use of water, water power and similar matters connected with California's natural resources. This body was both investigative and fact-finding and served to keep the State Legislature informed on matters falling within the scope of its activities. It was quite obvious that such a commission would agree with the State Board of Fish and Game Commissioners when in their report to the governor in 1913 they recommended the establishment of game refuges, areas where hunting would be absolutely prohibited.

It was natural that the State would turn to the National Forests with their large areas of public wild lands as the logical place in which to set aside game refuge areas. Not only because of a deep interest in wildlife as part of their administration policy, but also because an area closed to hunting represented a much lesser degree of fire hazard, the Forest Service officials were willing to go along with this game refuge venture. As a matter of fact, it must be conceded that the federal forestry bureau was perhaps a little bit too enthusiastic about this game refuge plan on account of the dual purpose it represented in fire protection and game propagation.

Instead of following the system used by Gifford Pinchot in Pennsylvania, where such remarkable accomplishment in depleted game restoration has been brought about by creating a large number of small game refuges fairly close together, fewer refuges but each embracing a large area of land, were established. In 1914 and 1915, game refuges set aside in Southern California included approximately 600,000 acres of forest lands. More large refuges were created in other National Forests of the State in 1916 and 1917.

Conservation was making decided progress in California. The National Parks were already game sanctuaries, so some million and a half acres of the most suitable lands of the State now provided a refuge for wildlife. It was believed at the time that surrounding areas would be naturally restocked with native game animals and birds from the refuges.

In 1920 the California Conservation Commission was organized to further deal with conservation problems. This body, impartial, non-partisan and non-political, differed from the average legislative commission or committee in that it included in its membership representatives of federal and state forestry, stockmen, farmers, railroads, officials of the University of California and men from private industrial concerns. This new committee reduced all proposed legislation related to forestry and kindred matters to layman terms, studying in detail such problems of State-wide interest as light burning, high lead logging, forest taxation, fire hazards and recreational use of wild lands.

Water and Land

The history of rural California land use is largely a saga of water. Her forested mountains, which provide the timber and a large proportion of her mineral wealth, function in their biggest way as a giant sponge furnishing the waters which mean the very economic existence of the lower-lying lands.

Except in the case of broadcasted cereals such as wheat, oats and barley, very few agricultural products can be produced without irrigation. Farming, after all, was now the State's leading land use venture. A native Australian in the year of 1910 making an official investigation of agricultural practices in the United States and particularly of the intensified irrigation farming methods of California, said, "In the East farming is a calling, in the West it is becoming a profession".

In the first and second decades of the century, experts tersely summarized California's three leading water problems as (1) The Colorado River (2) Los Angeles use and needs (3) Sacramento River Control. The best minds of the State were at work on all three problems and were discovering interesting facts about the potential water supply available for California lands. One of the facts uncovered was the immense volume of water produced by even comparatively small mountain watershed areas.

In 1915 the rugged San Antonio watershed, embracing less than 20,000 acres, furnished irrigation water for 25,750 acres producing citrus fruits, alfalfa and sugar beets to the value of \$5,400,000 annually, grown on intensively-used farm lands. The same year further to the south the San Diego River Watershed of less than twenty square miles provided water for 5,800 acres of citrus fruits, the production of which was valued at \$2,600,000 a year.

Drainage on much of California lands was of equal importance to irrigation and in line with the 1903 drainage district legislation the State Legislature in 1911-13 enacted special laws creating the Sacramento-San Joaquin Drainage District. This territory, embracing some of the richest lands in California, subject at times to ruinous floods, included the low-lying lands along the Sacramento, Feather and San Joaquin Rivers from Butte and Glenn Counties on the north to Fresno County on the south. By 1920, 1,100,000 acres of fertile farm lands had been included in this district and in smaller areas under separate management, and a total of fifty million dollars had been expended in reclamation district improvements in the way of levees, check dams and waterways.

When the great irrigation expert, George Chaffey, left the Imperial Valley project in 1905, the troubles of the agricultural land users of that section were by no means over. True, Chaffey had delivered Colorado River water to the arid lands of the Southwest and made the desert blossom as the rose, but this was done in the simplest possible way, and considering the magnitude of the undertaking, at an absurdly low cost.

As previously mentioned, the level of the Colorado River bed lies above the Imperial Valley. Chaffey made two cuts through the dividing lands to bring the river water into his main canal. Unprecedented precipitation in the Colorado River watershed during the winter of 1905-06 enlarged these gaps and the flood waters of the river rushed through, wrecking irrigation structures and seriously threatening the very existence of the populous, fertile Imperial Valley.

Without Chaffey's guiding hand the California Development Company was unable to cope with the situation, either from an engineering or financial standpoint and in December 1906 we find President Roosevelt appealing to the wealthy Southern Pacific Company to step into the breach to protect both the settlers and the large vested interests they themselves had in the area. The breaks were repaired by early 1907, the waters of the untamed Colorado having been meanwhile twice turned back into their natural channel.

In 1909 the California Development Company went into receivership and that same year Congress appropriated one million dollars for protective works. The United States Bureau of Reclamation thus became a partner in what was later one of their greatest accomplishments, as well as one of the world's largest irrigation and flood control projects. The Southern Pacific Company, which had checked temporarily, at least, the raging Colorado torrent, became the owner of the tangled assets of the California Development Company.

Various mutual water companies, as subsidiaries of the California Development Company, were purchasing water from the parent concern for re-sale to the farmers and in spite of trouble and setbacks, irrigation progress steadily continued. By 1906, 130,000 acres were under cultivation and water rights had been purchased by users through the mutual water companies for 70,000 acres more. By 1910 the irrigated area included in the Imperial project was over 180,000 acres in California and 15,000 acres in the Republic of Mexico.

The patchwork system of water control was decidedly unsatisfactory to the settlers, so on July 5, 1911 by an overwhelming vote of the water users, the Imperial Irrigation District was organized under the provisions of the Wright Act. The district, as originally formed by the irrigator-owners, included 523,600 acres. Five years after its creation the district's land users purchased outright for three million dollars the entire water interests of the Southern Pacific Company, and at the close of the second decade of the 20th Century two thousand of these land users were engaged in paying off the indebtedness of their own water system. It was not till more than a decade and a half later, however, when the great Boulder Dam was completed that Imperial Valley farmers slept securely, and that the ever-present threat of the erratic Colorado hanging both figuratively and literally over their heads, was removed.

The tremendous growth of the Southern California area of which the City of Los Angeles is the hub soon created water demands far beyond the available local supply. With real estate values increasing by leaps and bounds and booms in both urban and rural lands the order of the day, the citizens of Los Angeles started action in 1906 to acquire Owens Lake and the surrounding Owens Valley, precipitating one of the bitterest fights in the history of California water development.

Owens Valley, lying at the foot of the eastern base of the southern Sierra Nevadas, approximately 3,600 feet above sea level, had as its center Owens Lake, into which drained never failing mountain streams. The valley was settled by farmers and stockmen between 1850 and 1880 and their land holdings had been converted into prosperous well-watered homesteads.

These independent, well-to-do settlers bitterly fought the efforts of the Los Angeles metropolitan population to evict them from their farms, even in the face of decidedly fair prices offered for their lands and improvements. But Los Angeles needed water and the wishes of the comparatively few farmers who stood in the way of Owens Lake becoming a reservoir for a metropolis 225 miles distant, could not stand against the needs of several hundred thousand urban and urban-rural residents.

The Los Angeles people finally won out. The fact that the 225-mile aqueduct to convey the water extended through rugged desert terrain was a mere bagatelle to the metropolitan land boomers, and it was built at a cost of twenty-five million dollars. A plentiful supply of water was now assured for the rapidly growing Los Angeles area, as it was generally thought then, for all time to come. One of the enterprises made possible by this great volume of new water was the Goodyear Rubber Company which, when assured of a plentiful supply of water, promptly built a twenty-million dollar factory in Los Angeles. This concern alone used six million gallons of water daily in its operations. To provide for future expansion, San Fernando Valley of some 50,000 acres of dry grain fields and one of the agricultural suburbs of Los Angeles, was piped for water.

After years of bitter contest, Owens Valley constituted the Los Angeles water reserve, although even then some of the more ardent believers in the coming greater growth of that section were looking towards the large volume of the Colorado River as a still further insurance against metropolitan water shortage.

Meanwhile California's complex irrigation system was gradually progressing in other sections of the State, in spite of the innumerable controversies over water rights. The Wright Act was proving a great boon in giving the little owners somewhat of an even break with the big land owner. In 1911, California irrigation bonds clogged the market but the State Legislature came to the rescue by giving them the same legal status as county and municipal bonds.

At that time, Edward Hyatt, State Engineer, reporting on the workings of the Wright Irrigation District Law, stated that 166 districts including 6,100,000 acres had been organized. However, 49 of the districts, embracing 2,104,000 acres, had been dissolved and two of the remaining 117 were going through the same process. Twenty-two of the districts were inactive. The total irrigation bonds outstanding had a face value of \$96,503,000. Under the law as it then stood, purchasers of land in a district acquired a share in the water system belonging to that district.

The U. S. Bureau of the Census had stated that two years previously, or in 1909, out of California's 88,197 farms, 39,352 irrigated. However, included in the official census figures were farms in many municipal districts and commercial water companies, besides the irrigation districts organized under the State law.

There were also many irrigators who owned their individual irrigation works, such as the firm of Miller and Lux. Henry Miller, land grabber though he always was, nevertheless, was

always a prime mover in irrigation projects. In 1915, when credited with the ownership of one million acres of land and one million head of cattle, he established a colony on his San Joaquin Valley lands, selling water to the settlers at \$1.25 to \$2.50 per acre, rated among the cheapest irrigation water in the West.

The 1909 State Census figures showed 350,723 acres irrigated exclusively from wells, 620,951 acres watered by gravity flow, and the balance by a combination of gravity irrigation and pumping from streams. In 1912 the United States Department of Agriculture completed an agricultural and irrigation survey and gave the following figures covering all California, and the Imperial Valley:

Total area of valley agricultural lands14,346,200 acres
Total area of foothill agricultural lands	.. 1,519,000 "
Total area of irrigated lands 2,447,160 "

There is no reason to doubt the accuracy of these figures and it is interesting to note that while this detailed report gave a figure of 3,449,000 acres of agricultural land in the Sacramento Valley proper, it is classified only 123,500 acres as being actually irrigated, somewhat of a concession that large grain farms and livestock ranches were still leading agricultural ventures in that area. Of the 472,000 of agricultural land listed as lying east of the Sierra Nevada Range, 137,760 acres were under irrigation.

Brief mention was previously made of the organization under the Wright Act of the Modesto and Turlock Irrigation Districts in 1887. Not only were these two of the oldest official State irrigation districts, but apparently among the best managed and most successful.

The Modesto District included a gross acreage of 61,183, of which 4,165 acres was classified as being "poor" farm land; 5,040 acres as "fair", 45,334 acres as "good," and 26,624 acres as "especially high class" lands. Prior to irrigation, the area had eighty-one 1,000-acre farms which produced an annual revenue of \$575,000 from wheat, barley, and stubble pasture. In 1920 there were 2,625, forty-acre irrigated farms, which produced a gross revenue of \$8,765,000.

Within twenty years from the time water was applied to the lands the population of the district increased from 3,500 to 24,000. The number of inhabitants of Modesto, the chief urban center, had increased from 2,200 in the latter nineties to 14,000 in 1920.

The value of land in the district prior to irrigation was placed at \$2,410,000, or an average of \$30 per acre; in 1920 the same land was valued at over \$20,000,000, with some farm lands rated as high as \$800 an acre, - all values exclusive of structural improvements. In 1919, 7,000 acres was set aside for highways, roads, ditches, buildings and other structures, and 6,000 acres were growing paying crops without direct irrigation, the land being sub-irrigated by seepage from canals and ditches.

In 1919, the Modesto Irrigation District had 152 miles of canals and 44 miles of drainage system, delivering water to 59,000 cropped acres. That same year the district had a bonded indebtedness of \$4,214,000, or \$52.50 per acre, yet its optimistic prosperity was reflected by the member-owners voting a new bond issue of two million dollars for further development. In the wheat days of the eighties over sixty percent of the land holdings of the district carried mortgages, of which twenty-five percent were subsequently foreclosed. From 1910 to 1920 an average of only two foreclosures a year were recorded.

The Turlock Irrigation District showed a similar prosperous development. Much larger than its twin district, Modesto, it included a total of 176,200 acres of which 101,420 acres, or 57 percent, was under irrigation in 1920. Prior to irrigation days, only about twenty-five percent of the district's area was under cultivation, producing an average of eight sacks of wheat or ten sacks of barley per acre. The balance of the sandy land of the district was being used as indifferent pasture.

The Turlock Irrigation District showed the following recapitulation at the close of 1920:

	<u>In 1890</u>	<u>In 1920</u>
Number of Farms.....	140	4,000
Average acreage per farm.....	1,250	40
Rural population	950	15,000
Population of Turlock (urban center)	150	5,000
Value of unirrigated land per acre	\$25	\$100
Value of irrigated land per acre	---	\$200
Total value of land in district	\$4,403,000	\$26,161,900
Value of livestock, implements, machinery and improvements	\$1,656,200	22,047,000
Annual gross value of farm output	345,000	9,000,000
Average annual cost of production	143,000	4,500,000
Available for farmers' living depreciation, improvements, obligations, etc.	202,000	4,500,000

Irrigation works of the Turlock Irrigation District in 1920 represented an investment of \$3,800,000, of which seventy percent was borrowed. The district included within its boundaries 245 miles of canals and main laterals, 1,000 miles of irrigation ditches and sub-lateral canals, and 57 miles of drainage canals. Like the Modesto District, twenty percent of the bonds were owned by the residents of the district themselves. From 1902 to 1919, the Turlock District retired over \$1,150,000 of its bonds. Besides the water furnished by their own irrigation works, both the Modesto and Turlock Districts shared in the use of Hetch-Hetchy water, developed primarily for San Francisco urban consumption.

In 1919, Colonel Robert Bradford Marshall, irrigation engineer and enthusiast, aroused a lot of interest in his plan for State-wide water development. The "Marshall Plan," as it came to be headlined in the newspapers and recorded in the State archives, was the most ambitious water plan yet proposed for California, and came out about the time that President Woodrow Wilson was asking that 300 million acres of land be developed in the West as homes for veterans of World War I.

Idle land was plentiful enough in the Great West and in California to meet the chief executive's appeal; water for such lands was an entirely different matter and an exceedingly complex proposition. Colonel Marshall, who knew every corner of California, in writing about twelve million acres of potentially irrigable farm lands in the Sacramento and San Joaquin Valleys, was somewhat of a prophet when he proclaimed; "We used to think in thousands of dollars, then in millions, but now we are thinking in billions."

Marshall's plan, in brief, involved the construction of huge reservoirs starting on the headwaters of Pit River Valley, Round Valley, Big Valley, and Fall River Valley each would include a large reservoir, the conversion of these big, fertile mountain valleys to lakes being justified by the use of the water they would impound for use on the higher-producing lands in the Great Valley area where a much longer growing season existed.

It was proposed to supplement these high country reservoirs with massive dams on the main rivers and a system of distribution canals skirting the upper edges of the Sacramento and San Joaquin Valleys. In addition to his plan to provide water for California's immense agricultural area embraced in the Great Valley Region, Marshall had a companion scheme to construct an aqueduct to bring the water of Kern River to the Los Angeles area, thus nearly all the water used in California was that to be produced within her own watersheds.

Marshall was dubbed a dreamer by some less visionary irrigation engineers, yet less than twenty years later many of the essential

details of his plan were adopted when the Great Central Valley Project was undertaken. His prophecy of the huge investment required and the values at stake was also later proven.

It can be said that during the years 1906 to 1920, California really began to intensely study her water needs and available resources. Frederick Haynes Newell, conducting irrigation investigations on a national basis in 1906, gives California distinctly a first place in the nation in the volume and complexity of water problems. He describes a map of the network of canals and ditches then existing in the southern San Joaquin Valley as resembling a huge spider web.

Irrigators were concerning themselves with every possible scheme to prevent water wastage. Tiny rivulets were diverted through iron pipe to adjacent lands and concrete storage tanks were coming into greater use on the more valuable farms. Porus clay pipe conducted water through orchards and concrete flumes replaced ordinary ditches.

A pipe-making machine was perfected which manufactured pipe by depositing material directly in the trench dug by machinery to receive it, the trench being filled up as soon as the concrete pipe hardened. California cement was one of the best friends of the California farmer. To save water, cement hydrants were placed near each tree or plant row and soon became a familiar sight on California farms. Only the high-producing capacity of much of California's land justified the lavish expenditure sometimes necessary to provide the vital water needed to bring these lands into maximum production.

Since in many places water development came high, irrigation water costs greatly varied in various sections. At times the Federal government was the only agency financially capable of underwriting the bigger projects. From the proceeds of the sale of public lands the U.S. Bureau of Reclamation, fast becoming the leading agency in big scale water development, had at its disposal in 1906, twenty-eight million dollars to carry on development work.

Kings River water from the Fresno Canal cost farmers only 65 cents per acre. The Anaheim colony paid \$4.30 per acre-foot, per year. In the south Riverside orange growing district the cost was \$15 per acre-foot. Azusa farmers paid \$5.00 per acre for their water, those of the Ontario section nearby \$10.00 per acre, while agriculturists in the immediate vicinity of Los Angeles paid as high as \$32.31 per acre-foot. Over Southern California generally, it cost \$5.00 to \$30.00 per acre to adequately irrigate farm lands, with an average cost for all types of land around \$10.00 annually.

One of the leading irrigation experts of the time asserted that "successful irrigation (in California) requires that the land shall receive a minimum of 18 inches of water per year." With such a measure as a standard, much of California's land was being short-changed as some of the land users getting more than their fair share of water were battled by those not getting enough. The San Francisco Chronicle declared on October 23, 1916 "One can hardly go anywhere in the State where there is not a contest brewing about water. The courts and commissions dealing with the subject are overcrowded with water contests." California's vital water problem was yet a long ways from being solved.

As water development progressed, hydro-electric development as a natural adjunct materially progressed also and while the chief market for the output was the large metropolitan centers, rural California shared materially in its twin blessings of light and power. The earliest hydro-electric plants in the State were more or less experimental and used to run mills and mining machinery. Altho municipal plants were operating in many communities, the first commercial hydro-electric, high tension transmission plant was constructed in the town of Folsom in 1895.

The Bureau of the Census gives the total electric energy generated in California as 143,684 H.P. in 1909; 291,344 H.P. in 1914, and 572,284 H.P. in 1919. In the last named year nineteen commercial concerns were operating eighty plants, furnishing power to 596 cities, towns and villages.

The outstanding, municipally-owned Los Angeles Bureau of Power and Light was expanding by leaps and bounds. The Big Creek project of the Southern California Edison Company got under way in 1911. The San Joaquin Light and Power Company, the Great Western Power Company, and the Pacific Gas and Electric Company were also undertaking big development, presaging their future enormous distribution of electric energy to California cities and farms.

Farms and Farm Production

More irrigation meant greater crop production. Official State figures place the total value of agricultural production in California at \$205,063,000 in 1909. Ten years later this had reached a figure of \$729,661,000. The number of individual farm units increased from 88,197 in 1910 to 117,670 in 1920.

While the population of the State as a whole expanded from 2,377,549 in 1910 to 3,426,861 in 1920, the percentage of increase in rural population was less than half as much. The farm population is given in the census figures as 371,309 in 1910 and 469,090 in 1920, altho in the latter years the official figures indicate that there were actually living in rural territory 516,770 people.

The total land included in farm holdings in 1920 was given at 29,365,667 acres, of which 11,878,339 acres were classed as improved farm land. The total value of farm property that year was \$3,431,021,861 of which the value of the land alone represented \$2,783,054,977. With the ever-increasing number of small land owners engaging in such enterprises as fruit production and poultry raising, the average farm unit area dropped from 317 acres in 1910 to 250 acres in 1920.

The U.S. Bureau of the Census gives the following classification of California farms in 1920, any agricultural unit of three acres or over being classed as a farm:

<u>Size of farm unit.</u>	<u>No. of farms</u>	<u>Acreage</u>	<u>Total value</u>
Under 20 acres	34,067	296,403	\$354,330,586
20 to 49 acres	31,723	961,155	594,205,184
50 to 99 acres	15,034	1,045,972	420,412,118
100 to 174 acres	13,217	1,841,847	386,799,268
175 to 499 acres	13,671	4,095,679	581,264,276
500 to 999 acres	5,052	3,466,412	325,942,833
1,000 acres and over	4,906	17,638,199	768,067,596
Totals	117,670	29,365,667	\$3,431,021,596

Of the farms of all sizes listed, 25,012, with a valuation of \$764,166,000; carried mortgages totalling \$224,064,000. About 44,000 of the farms of the State, census takers reported, were free of debt.

The average value per acre of California farm lands more than doubled in ten years, increasing from \$51.93 in 1910 to \$104.67 in 1920. Comparative figures of the value per acre of farm lands in other agricultural states that same year show Iowa as \$227.09; Illinois, \$187.59; Kansas, \$62.30; North Carolina \$53.76, and Texas \$32.45. Taking the United States as a whole, the average value per acre of improved farm land was \$69.38.

It will be noted from the farm size classification shown in foregoing figures that while the intensively-cultivated, small farm units averaged almost \$1,200 per acre in value, the almost 5,000 farms of the State, covering an aggregate area of nearly seventeen and three-quarters million acres, had an average value of approximately \$43.55 per acre. When it is considered that these big land holdings embraced a large percentage of low value, uncultivated wild lands, it is evident that a lot of big land holdings were also intensively cultivated, in other words, were huge farm factories growing crops on a mass production basis. These large farms had increased somewhat in number during the preceding decade, since the 1910 census says there were 4,693 then in existence.

During the period 1905 to 1920, barley took the place of wheat as California's leading cereal crop. California still had large grain ranches. The average annual area for the five-year period 1905-1909 was 1,210,000 acres of wheat and 1,196,000 acres of barley; during 1910-14, the average annual figures show wheat grown on 420,000 acres and barley on 1,404,000 acres, while for the 1915-1919 period during which world war conditions increased the demand for bread cereals, the average annual area of wheat rose to 552,000 acres and that of barley dropped to 1,241,000 acres.

Mention has been made of the increase in livestock production during the war years of 1917 and 1918. However, even under the impact of war demands, numbers of beef cattle did not reach the all-time high of 1910 when it was stated that there were 1,625,000 head of this type of cattle on California farms and ranges.

The average number of cattle of all types and classes during the five-year period of 1911 to 1915 was 1,199,000 head. Approximately thirty percent of these were dairy stock. There were 2,171,000 head of meat cattle in the State in 1918. In 1920 the official figures show 515,000 milch cows and 1,493,000 head of cattle of all other classes. In 1920 the census also credits the state with 402,000 horses, 63,000 mules and mule colts, and 509,000 hogs.

The approximate seven-million sheep population of the late seventies never again roamed the California ranges. In 1905 their numbers were down to 2,130,000 head, after which the figures showed an upward trend. By 1920 their numbers had increased to 2,440,000. The census takers also counted 115,760 head of goats of all ages that year. In 1919, California wool and mohair production was 249,958,000 pounds, valued at \$6,805,000, and approximately fifteen million pounds less the following year.

The 1920 census lists 10,311,000 individual poultry birds on California farms, with a value of \$15,293,000. California hens laid 44,761,000 dozen eggs in 1919 and the total value of these eggs plus chickens marketed is given by the official enumerators as \$40,341,000. The climate and flora of California were also particularly favorable for apiarists, who in 1919 marketed 5,501,000 pounds of honey and 106,800 pounds of beeswax which brought them a revenue of \$1,142,000.

Rounded off official figures of livestock on California farms and ranges in 1919 show the value of cattle of all classes at \$120,700,000; horses, mules and burros, \$7,400,000; sheep and lambs, \$25,900,000, and poultry, \$10,811,000. In 1919 the farmers' income from meat animals was 101 million dollars; from dairy products, 48 million; from vegetables, 71 million; from fruit and nuts, 262 million, and from all other crops, 145 million.

On an all-crop basis, the average production per farm in 1919 was \$5,012, as against \$1,661 ten years earlier. Since the figures included many extremely small farms, the average farm unit production figure is another indication of big farm operation which a local author later so aptly referred to as "Factories in the Field."

In 1919 beans were grown on 471,600 acres, producing a crop of 6,552 bushels with a value of \$30,798,000. Peas occupied 20,890 acres with a yield of 132,700 bushels, worth \$649,000. Seed farms were assuming an important place in the State's agricultural industry, and in 1919 the harvest of 52,000 bushels of grass and clover seed brought in a revenue of almost one million dollars to the growers. The value of flower seeds produced that year was \$5,472,000.

Hay and forage crops held a leading place, covering 2,203,000 acres with a yield of 4,495,000 tons, worth \$91,353,000. Alfalfa was the leading forage crop grown in 1919, a yield of 2,412,000 tons being secured from 718,515 acres.

In 1919, vegetables produced commercially on 146,200 acres brought the growers a revenue of \$24,111,000. In addition, Farmers gardens produced vegetables for home consumption to the value of \$2,370,285. That same year sugar beets were grown on 82,200 acres, the harvest yielding 666,800 tons with a value of \$10,577,000. California was by 1919 a recognized competitor of Dixieland in cotton production when the crop of 46,418 bales, grown on 87,308 acres in the Imperial and San Joaquin Valleys was given a valuation of \$10,577,435. Increase in the State's production of cotton had been 324 percent since 1909.

The following statistics, covering either 1919 or 1920 production, gives some idea of the growth of California's fruit industry which was shipping fresh, canned, and dried fruits to all parts of the world:

Product	No. of bearing trees or vines (000 omitted)	Volume produced (000 omitted)	Value (000 omitted)
Apples	3,128	7,842 bu.	\$12,155
Peaches	9,058	15,969 "	29,543
Pears	2,305	3,953 "	7,115
Plums & Prunes	8,768	13,200 "	28,382
Cherries	657	654 "	2,615
Apricots	3,638	5,908 "	11,815
Grapes	153,195 vines	2,055,645 lbs	65,780
Oranges	10,298	21,628 boxes	67,048
Lemons	2,685	6,552 "	19,000
Grapefruit	231	465 "	930
Figs	504	21,802 lbs	2,160
Small fruits grown on 7,900 acres			3,093

According to the Federal census of 1920, in a list of fifty leading agricultural counties of the United States, Los Angeles county ranked first in the value of farm products marketed; Fresno county, second; San Joaquin county, fourth; Tulare county, seventh; Sonoma county, eighth; San Bernardino county, twelfth; Orange county, fifteenth, and Santa Clara county, seventeenth. A rather peculiar fact in this comparison was that due to its great volume of potato production, Aroostook county, Maine, with a climate so dissimilar to California's main farming areas, stood third place in this respect in the nation.

The magical growth of Southern California is almost unbelievable, and its expansion during the 1906-1920 period was much greater than other sections of the State. Standing forth as the leading agricultural county of the nation, Los Angeles is the production center of the eight counties comprising this remarkable area. Besides Los Angeles, these counties are Imperial, San Diego, Orange, San Bernardino, Riverside, Ventura, and a large part of Santa Barbara, covering a gross area of 28,951,480 acres which includes almost every type of land from rugged mountain peaks and waterless desert, to the most intensively-used rural and urban lands in the world.

The Weather Bureau described the climate of the farming section of this region, as well as that of the great Interior Valley Region as "one of the most equitable in the United States and for the most part free from killing frosts."

In 1900 the population of Los Angeles county was officially listed at 170,298; in 1910 at 504,131; in 1915 at 815,000, and in 1920 at 936,455. The population of metropolitan Los Angeles grew from 102,479 in 1900 to 319,198 in 1910 and to 576,673 in 1920. Most of the Southern California cooperatives and other rural land-using organizations maintained their headquarters in the hub city of Los Angeles, one of them being the great California Fruit Growers

Exchange which had its birth and witnessed its greatest growth in the Southern California area.

Big Scale Land Use.

Farmers cooperatives such as the California Fruit Growers Exchange were not only engaged in the actual marketing of fruit crops, but were conducting scientific investigations in methods of planting, growing, harvesting, and handling of fruit crops from the time of the planting of the seeds or seedlings until the matured packed fruit reached the ultimate consumer.

Cooperatives were also working with official Federal and State agencies in advising farmers relative to their crop production and were broadening their field of service to the land user in such matters as centralized purchasing of fertilizer, packing materials and the furnishing of farm labor. Some fruit farmers, indeed, had little actual physical contact with the lands which formed their farmstead, as their own particular cooperative handled the harvesting of the fruit and sometimes all phase of its production, paying the landowner the net proceeds of his orchard or vineyard.

It was about this period that it might be said was commenced the process of handling California fruit and nut products with kid gloves - as it were. As a matter of fact, after grading and washing, fruit was untouched by human hands, being wrapped and packed in containers by workers wearing clean, soft gloves. Meticulous attention was given to different methods of curing various orchard products, and to sorting and grading. It is a matter of record that about this period California lemons, just coming into heavy production, were laughed off the market in competition with the European product until the local cooperatives paid the proper attention to curing, grading and packaging.

Many California farmers were forced into the membership of rural cooperatives mainly by virtue of the more efficient methods used, as contact with the independent grower who marketed his crop on a catch-as-can basis. The rapidly growing California Fruit Growers Exchange so publicized the trade name "Sunkist," as applied to their citrus products, that in many parts of the world the term is still believed to cover a special species of high grade citrus fruit, instead of its being a guarantee of high quality.

California land prices were so high that it was virtually impossible for any farmer to get a start unless he had considerable inherited capital or funds derived from other sources. The lot of the tenant farmer and farm laborer was apparently hopeless, and large land holdings were still the curse of rural California.

About 1915 California was very much concerned over her entire agricultural land use situation and at the State capitol it was tacitly agreed that agriculture had reached what one official phrased as "a stage of arrested development." That year 310 proprietors owned over four million acres of land suited to intensive farming, some used in large scale operations, but a large part of which was lying idle.

One firm alone owned almost a million acres of first class farm land. In Kern county four land companies owned over one million acres, or half of the land of the county held in private ownership. Many relatively small landowners found it more profitable to rent their farms, generally to alien tenants, than to operate them personally - and much easier.

In the fruit belt of Placer County in 1916 half the fruit ranches were operated by tenants, mainly Japanese. A man with a forty acre fruit ranch in that section could rent the same for \$1,200 to \$2,000 a year, realizing ten to fifteen percent on his investment. The alien tenant made around \$1,000 a year which, with his low standard of living, was for him a profitable venture. One large mixed operating company working in that section (almost in the shadow of the State capitol) owned sixteen ranches and rented six more. Of the wealthy delta district lands further down the Sacramento, 300,000 acres was leased to Jap tenants, and even by 1916 many such had become rich by Oriental standards and returned to their native land.

Sixty percent of the farm laborers of the State in 1916 were migratory, poorly housed, or not at all - often sleeping in haystacks or underneath the shelter of such trees as the ranch on which they were working afforded. The number of Japanese and Hindu farm workers was annually increasing and while the feelings of the people of the State at large were very much against the increasing hordes of Asiatic land workers, in many rural sections a deeply-rooted prejudice against white farm workers gained ground because such laborers were prone to demand a white man's wages and a semblance at least of a white man's standard of living. At the State capital this class was characterized as becoming a menace to political and social peace.

Rural Land Colonization

In an attempt to find a remedy for the labor situation in rural districts and some method of getting landless men on manless lands, the California Commission on Land Colonization and Rural Credits was appointed in 1915. Almost immediately after appointment, following a preliminary study of the rural land use situation, it publicly announced that California had an area of 24 million acres of farm land, of which only 11 million acres was being cultivated; that few rural settlers were coming in, and that during the years 1910

to 1915 the gain in population in California cities and towns was three times that of the gain in rural districts.

The situation in rural California, with all its potential wealth and its development to date, it pointed out, was somewhat grave. The regularly appointed State commission was joined by an active committee from the Commonwealth Club in an endeavor to analyze the entire farm land situation. This joint investigating body found that as compared to the balance of the United States the average price at which both improved and unimproved farm lands were being held in California offered slim hopes of getting real farmers to come in as settlers. The investigators uncovered one outstanding fact, however, which was that in a great many cases where settlers with mutual economic, social or religious interests had pooled their capital and founded cooperative colonies, success attended their efforts.

The Colonization Commission and their volunteer associates worked hard during 1915 and 1916 in their intensive study of California rural land use and had their very detailed report in the hands of the governor by the end of the latter year. They had interviewed and carefully investigated 991 settlers on their farms on twenty-four of the State's more recent farm colonies.

The investigators found that the average price paid for unimproved land by these colonists was \$160.00 per acre. The time allowed for payment ranged from 3.2 to 11 years, with an average of 5.8 years. The average settler's capital was \$4, 14 and cost of improvements on the average farm, \$2,367. In November 1916, out of the 991 farmers investigated, 719 were still in debt for their land, owing an average of \$2,931. Still using average figures, therefore, each settler paying off a mortgage had an equity in an approximately ten-thousand dollar farm plant of some two-thirds of its value, in return for six years labor and his original capital of \$4,314.

Reference has already been made in this history to the Ontario, Pomona, Anaheim, and Raveah colonies, but these were all founded before California land prices had reached the ballooned proportions of later years in the areas in which they were located. Since land colonies have played such a big part in California rural development and in general had some deterring influence on large land exploitation schemes, some of them are being herewith briefly mentioned.

Among the earlier colonies established was that of the Alabama Colony, started in Hadera county by Alabama cotton planters immediately after the close of the Civil War. Veteran Confederate officers of the ante-bellum aristocratic type, these colonists were very impractical farmers and took to raising wheat in a section at that time best adapted to cattle raising. In following this type of farming they incurred the enmity of the surrounding common as

well as facing the existing post-war prejudice of the locality towards those who wore the Gray in the great American conflict. This colony was a failure. About the same time, however, a considerable group of Protestant Irish, seeking religious freedom in America, settled as organized colonists at Woodville in Tulare county and became successful sheepmen.

Portuguese from the Azores settled in colonized groups in Stanislaus, San Joaquin, Kings, Madera, Tulare and Fresno counties in the seventies and eighties. Good farmers, with an inherent love of the land in their makeup, the settlers on these dozens of Portuguese colonies established up and down the San Joaquin Valley between 1870 and 1900 became successful agriculturists, and by 1930 the Portuguese-Americans controlled 75 percent of the dairy industry in California. The largest individual Portuguese colony was that established around the town of Hanford.

Swiss-Italians and Swiss-Germans, by virtue of their numerous small cooperative colonies, established themselves throughout the Interior Valley Region in the eighties and nineties. The northern Italians were practical farmers to begin with, but people of this nationality from the Sicily or Naples areas generally settled in the towns and cities. The pure Swiss, less clannish by nature, usually became independent farmers from the start, altho often settling some area in groups.

One Swiss emigrant, Andrew Mattei, located near Fresno in 1890. By 1910 he had acquired 1,200 acres of choice valley land, all set out to vines. He produced his first wine in 1902 and in 1912 manufactured 300,000 gallons of high class wine and 1,000 gallons of brandy from grapes grown on his own lands.

Equally successful viticulturists were the Italians of the Asti Colony on the Russian River in Sonoma county. Founded in 1837 by three Italian emigrants of rather small means, the wine products from this colony became internationally known, and in later years reached a production volume of four million gallons per annum. Here is found the largest wine vat in the world, the veritable lake of wine which it contains reaching proportions of half a million gallons.

In 1874, Chapman, the famous purchaser of half breed scrip, broke up 4,000 acres of his cheaply-acquired lands near Fresno into 20-acre farms to form what was called the Central Colony, settled mainly Scandinavian emigrants. Headed by Bernard Marks, former school teacher and gold miner, the colony was remarkably successful and became a pattern for future cooperative colonies. Almost equally successful was the Malaga Colony in the same general locality, where 7,400 acres was subdivided into small farms for Swedish Colonists.

The prosperous Danish Fresno-Scandinavian Home Colony of 1,920 acres was founded in 1880-81. The various small German Lutheran colonies, founded through the eighties and nineties all the way from Bakersfield to Lodi, also blossomed into prosperous farming communities.

Most of the cooperative colonies established by the various religious sects were eminently successful. Mennonites, mainly of German extraction, located colonies at Lodi, Shafter, Reedley, Rosedale and at other points in the Interior Valley Region. In spite of their straight-laced religious customs, these Mennonites were good farmers. About half of them came from Germany or Russia to escape religious persecution or compulsory military service, the other half from previously established but less successful colonies in Michigan.

One small Finnish Mennonite colony located near Reedley in 1905 and greatly prospered. The Temperance Colony, founded by Thomas Hughes and his sons in 1881 on a subdivision of 6,000 acres in the central San Joaquin Valley, developed into a prosperous farming community among the very grapes from which was fermented the juice that its members eschewed.

Some sectarian colonies, altho rural, were not agricultural but merely sanctuaries for the devotees by whom they were financed. One such was Father Riker's colony in the Santa Cruz Mountains, known as The Holy City. The head of the cult called himself "The King of All Wise Men," and like many other such characters impressed upon his followers the fact that he was, in part at least, divine. Volumes could be written on the peculiar colonies established by various cults and isms in California's kindly climate, ranging from nudists, walled in against prying eyes, to devotees of strange East Indian philosophies and sects whose mystic religious rites barely kept within the law of the land.

So far as social and religious environment was concerned, one could live in rural Germany, Finland, Russia, Denmark, Portugal or Sweden while still sojourning on the soil of California. Altho becoming later a typical American melting pot, for decades many European colonies maintained their racial purity and customs, made over only sufficiently to meet the living conditions of a Free America.

One large colony was that of Kingsburg in Fresno county, where farm colonization ventures were both popular and successful. Founded by Judge Frank D. Rosendahl, well known Swedish botanist, in 1885, the Swedish farm population numbered almost five thousand by 1920 and church services were held in the native language. It was not until the latter twenties that the racial purity of this colony was

disturbed when some of the original colonists, having become moderately rich from their farming operations, moved out to make way for newcomers from Oklahoma and other sections of the American West.

Assyrians and Armenians settled in colonies in the central San Joaquin Valley and became the commercial fig growers of California. These settlers from age-old fig producing centers taught American agriculturists new methods of fig production. Their custom of tying bunches of wild fig foliage to the cultivated trees was set down by native Americans as some sort of fetish until they learned that this was an old trade secret of pollenization, practiced by fig growers on the other side of the world since ancient times.

Just as did other European emigrants, these transplanted fig orchardists quickly developed the American spirit of independence. During their early days of settlement the Armenian colonists, finding Southern Pacific freight rates too high, organized mule and burro pack trains and used this mode of transportation to ship their crates of dried figs to the San Francisco market.

Life was not all beer and skittles for California colonists around the turn of the century and only mutual interest and unbounded faith in the land by dominant leaders kept many cooperative land use ventures from going on the rocks. Some of them did fail. One large colony, known as the 76 Land and Water Colony got under way on 30,000 acres of grazing land near Reedley in 1888. The colonists were all American-born, bound together not by religious beliefs or social customs, but by mutual interest in water for their lands. S.F. Earl was elected president of the settlers' mutual water company which was equivalent to making him manager of the colony. He retained this position till his death in 1915. Years were spent in bitter fighting for water rights and when the settlers got more water than they really needed they used it too lavishly, with the result that much of the land within the colony was alkalized. With a firm faith in its future prosperity, Earl held the colony together through thick and thin, and it eventually became one of the most successful farming communities in the south central section of the State.

One of the most ambitious land colonization schemes was that started by the Rev. Nels O. Hultberg near Turlock in 1903 on 100,000 acres of the sandy lands of that section. Hultberg was a land promoter and developer of the first rank. An Alaskan missionary and pioneer reindeer farmer of the far North, he was the discoverer of the great Nome mining field which precipitated the Klondyke gold rush of 1898. A public philanthropist rather than a selfish money-maker, when his mining claims were "jumped" and two of his young children died of exposure in the Alaskan wastes, he moved to California to become the promoter of the original Turlock colony.

Lured by the glowing accounts of its great agricultural possibilities, settlers rolled in to these sandy lands of the Turlock region. Hultberg conducted a boarding house for settlers, housing and feeding them while they were negotiating for the purchase of their lands. The raw, forbidding-looking land sold for \$25. per acre, and the pioneer colonists faced an apparently cheerless future. They were beset by violent windstorms which covered the landscape at times with Sahara-like clouds of stinging sand particles; plagues of grasshoppers attacked the crops after the land had been planted and watered, and sometimes the crops themselves were blown from the very ground. The promoter's unbounded faith and enthusiasm kept the settlers together, however, and the colony became an area of prosperous farms more than a decade before the State itself essayed an official colonization venture in the same general locality.

The State investigators, studying all forms of land colonization schemes and agricultural land use, found that the failure of colonies established in later years was mainly due to exorbitant land prices. Large landowners wrung every possible dollar from farmers and ruthlessly foreclosed a mortgage held against one settler's land, with generally another in the offing to step into his shoes.

The Laguna de Tache Colony (also in Fresno county), was started in 1906 when settlers could buy raw land at \$50 an acre. By 1916 the holding company had raised the price to \$100 per acre. With the average farm covering thirty acres, a farming venture became somewhat of a gamble for the settler with a small capital.

It was no philanthropic motive which prompted the holding company to lease land to the settlers on the Laguna de Tache project on a purchase-option basis at a price of \$3.00 per acre the first year, \$4.00 the second and \$5.00 the third, since the settler was obliged to pay an advance of five percent for each year the option ran, and must also have the land growing vines, alfalfa or some other crop specified in his contract at the end of the third year.

On this project a settler exercising his option would thus be obliged to pay \$115.50 an acre for his land at the end of the first year, \$121.00 at the end of the second year, and \$126.50 at the end of the third.

The lands within this commercial farm colony had a high agricultural value, however, and even at these prices, by hard work and good management, there was still a chance for a young man with fairly nominal capital to get a start in California farming. A good many settlers on this particular project became prosperous small landowners.

One successful land colonization scheme investigated was that of the Higgins Grant, just outside the city of Sacramento. Originally a Mexican land grant homestead of the standard 44,000 acres, it had

been purchased by Eastern capitalists a couple of decades previously, subdivided, and sold to settlers at \$50 an acre. At the time of its original colonization it had a population of fifty people and an assessed valuation of \$1,050,000. In 1916, its population was 2,250 people and its assessed valuation was \$3,140,000. Further subdivision in 1916 brought a price of \$200 per acre.

The promoters of one private colonization scheme about this time brought 150,000 acres of land at \$40 per acre and turned the land over to a paid agent for subdivision and resale. The selling price started at the fairly reasonable figure of \$75 an acre but subsequently jumped to \$175 per acre. Since the agent's commission was thirty percent, he received more than the original price paid for the land by the promoters of the project.

Down in Southern California the Fontana Colony in the San Bernardino Valley had been quite successful. This colony was located on a considerable area where small, intensively-cultivated fruit and poultry farms had replaced grain fields, and a lively urban center had been built up in the heart of the colonized lands. On this project the average price paid was \$345 per acre and the payment period only four years. That it was successful was due to the fact of its being settled mainly by a class of people who could pay cash for the lands purchased. The small farmers on the Fontana project enjoyed most of the conveniences of city life, - electricity, natural gas, urban telephone service, and paved streets bordering their farms.

Further west, the Van Nuys Colony engaged the attention of the Colonization Commission Members who thought that the average price of \$540 per acre for the small holdings into which it was broken up was prohibitive. They found to their surprise, however, that this development was extraordinarily successful. Many of the people who took up the small farms had considerable means and banded together for the assistance of their less fortunate neighbors on the project. This development also had the advantage of a ready market at its doors in nearby metropolitan Los Angeles, for poultry, rabbits and small fruits produced on the project lands. Later, with increased land values due to metropolitan expansion, many of the settlers on the project became moderately rich.

A good many of the residential sections of California's various large urban centers started out as private land colonization schemes such as that of Fontana and Van Nuys. In spite of the cooperative spirit generally existing among settlers on these private colonization projects there was generally nothing altruistic about the promoters of the scheme or the sellers of the land. High profits accrued to the owners of the land and to the agents selling the same to the settlers on the basis of flat commissions.

A rather successful case of farm land use, which was subsidized by capital advanced to penniless workers, demonstrated the possibility of unselfish cooperative agricultural effort in California. This was the Fort Ramie Colony, a project initiated in 1908 by the Salvation Army on a tract of land near Soledad in Salinas Valley. The Salvation Army bought the land outright and sold it in small tracts on easy, long time payments to indigent families from San Francisco. To bring in ready cash, the settlers secured work in the nearby sugar beet fields owned by the Spreckles' interests and the name of the sugar magnate is pretty well tied into the history of the colony. All the sugar interests ever did, however, was to furnish seasonal labor to the 100-odd settlers at a rich profit to themselves.

At first this project seemed doomed to failure due to insufficient irrigation water and lack of farm experience on the part of the settlers, but the persistent efforts of the directing officials and the small owners themselves finally brought success. Fourteen years after founding, or in 1912, every settler's land was paid for and the Salvation Army closed its books with a profit of \$12,000. It was no discredit to the colony that shortly afterwards the venture became superfluous, due to the Sugar Trust replacing the white field workers with Japanese labor.

As a final instance of this partial listing of the almost innumerable cooperative land colonies of California that of San Ysidre, much played up in the public press of some thirty years ago, deserves brief mention. Located 12 miles south of San Diego and near the Mexican border, this site, lying between the mountains and the seashore, represented almost ideal living conditions. The colonists were mainly discouraged white farm laborers, and styled themselves "Little Landers."

Established in 1910 on a more or less experimental basis, by 1913 the colony had over 100 families of no special sect, creed or political affiliation. Homesites, equivalent in size to town lots, sold for \$200 and single acres for from \$350 to \$600. Water was plentiful. The colony was a self-governing corporation and each land owner had a vote and equal say in the management of the colony affairs. The colony even had its own scrip good for purchases at the colony stores. Fruit, vegetables and other farm products raised on the tiny land holdings were sold in San Diego or in the local store. Most heads of families had whole or part time jobs in the city of San Diego or its environs.

In 1913, when crowds of itinerant laborers were crowding the city jails or being evicted by brutal police methods from the city limits, the management of the "Little Landers" wrote:

"We have not destroyed poverty (rural) but are showing the way for the future progressive builders of our country to model the future state ... The Little Lander is the enlivening factor that makes the saintly calling of agriculture and horticulture mean more to the individual because it comprehends infinitely more in improved methods and to the State because it is the guiding star towards the long hoped-for future, when the sons of the soil will be glorified in their mission of sanctified toil."

Land Prices and Income

The State Colonization Commission and their Commonwealth Club volunteer associates made detailed investigations as to the capital required and the profits to be expected from different types of farming ventures in California. Their findings in that year of 1916 were enlightening, and not too encouraging to the rural dweller of small means.

Lemons were beginning to take a leading place in California agriculture production. Planted lemon land, with adequate piped water, cost \$490 per acre. At the end of the fifth year, cultivation and care of a lemon grove had run the cumulative costs, with interest figured at five percent, to \$998.81 per acre. The first returns, coming in that year, brought \$42.50 per acre. By the end of the tenth year, with the same rate of interest applied, the cumulative cost had reached \$2,065.41 per acre and the crop values for the fifth to tenth years, inclusive, totalled \$960.50 an acre. The grower, therefore, at the end of ten years had a lemon grove against which there was a net deficit of \$1,124.91 per acre, with the land itself worth an average of \$1,000 per acre.

The value of the lemons harvested the tenth year was .255 an acre and the crop returns would increase in value each year for several years following. The figured costs were all-inclusive, involving labor, pest control, cultivation, cropping, taxes and all other charges. After the initial cost of \$490 per acre for the raw planted land, these all-inclusive costs ran \$62 per acre, per annum, for the first four years; \$136 per acre, per annum for the next three years, and \$195 per acre each year for the following three years.

In the matter of the production of the companion citrus fruit, the orange, figures were somewhat similar, and shoed the following:

Cost of land piped with water and planted to young trees,	\$490.00	per acre	
All costs for the first four years at \$60 per annum,	240.00	"	"
Costs for the next three years at \$95 per annum,	295.00	"	"
Costs for the following three years at \$135 per annum,	405.00	"	"
Accumulated interest on investment at five per cent. /	<u>423.53</u>	"	"

Total cumulative costs at the end of ten years \$1,853.53 " "

The first certain returns from an orange orchard came the fifth year with an average production value of \$39 an acre. The sixth year brought in \$78; the seventh, \$117; the eighth, \$156; the ninth, \$169, and the tenth, \$195, with relatively increasing annual returns thereafter. The orange farmer, therefore, in ten years had produced a total income from his grove of \$754.00 an acre, leaving him a net deficit of \$1,099.53 per acre, but he was owner of land having a value of \$1,000 to \$1,500 per acre, dependent upon location and other factors.

It was found that citrus land generally showed an average net return of 4.3 percent on the investment. It must be considered, however, that these figures covered a wide range of study and represented conservative averages. The small grower could adequately care for a ten-acre citrus grove, investing his own labor therein and during the first few years could also grow row crops such as beans or tomatoes between the trees, thereby adding to his revenue.

The 1916 study of the much more arduous dairy farming produced somewhat more encouraging figures. In the San Joaquin Valley good agricultural land could be purchased for \$200 an acre, including adequate water supply. The investigators figured on a 40-acre farm unit. The cost of improving a farm of this size, stocking the same and purchasing the needed implements and equipment, represented a total investment of \$13,600. The minimum income the first year was given as \$1,260 against which interest and taxes amounted to \$492.70. This left the farmer a net profit of \$767.30, but he also had a good part of his living expenses from the products of the farm. The minimum income the second year was given at \$2,760, with taxes and interest still \$492.70, leaving a net of \$2,267.30.

The Commission figured that barring sickness or other misfortune, the small man could make a start in a farm venture of this nature with \$2,000 cash, most of which would be paid out as a down payment on the land. They figured that the mortgage on the land and the debts against the livestock and equipment could all be cleared off by a diligent farmer at the end of twenty years, when the settler would have a farm plant worth in the neighborhood of \$15,000.

California's Colonization Venture

After some eighteen months of detailed study, the State Colonization Commission recommended that land colonization, subsidized by State funds, be undertaken in California. A bill was passed authorizing this activity in the handling of farm lands and under its provisions settlers on the official land colonies were given almost forty years to repay the State for funds advanced for the purchase of the land and its development into an independent farm unit. A Land Settlement Board, appointed in 1917 with Dr. Elwood Mead as chairman, was given an initial appropriation of \$250,000, to be repaid to the State in fifty years, with interest at four percent.

The figures released by the investigating body on agricultural conditions and the actual plunge of the State itself into the real estate business roused a great deal of interest in California with opinion about equally divided for and against official land colonization underwritten by the State government. The agricultural committee of the Commonwealth Club, which had so ably assisted the State officials in their land use studies, voted three in favor of the plan and three against it.

In view of the active part played in California land development by this non-official organization, a brief word may be interjected here relative to the great Commonwealth Club of California. Composed of leading public spirited citizens, whose joint opinions carried great weight in California affairs, its aims and objects are tersely epitomized in Article II of the Club's constitution which reads as follows: "The object of the Commonwealth Club shall be to investigate and discuss problems affecting the welfare of the Commonwealth (California) and to aid in their solution."

Voicing the feelings of those Californians who feared that government subsidization of farming ventures would adversely affect the American spirit of individual independence, Senator Frank H. Short in early 1917 addressed the Commonwealth Club in part as follows:

"I had thought ...that if there was anybody that was going to be exempted from official execution and enforced servitude, it was the farmer ...from time immemorial our proudest boast has been the free and independent farmer ...a farmer has to be a farmer ...it makes no difference how ordinary or common a farmer

may be, he will not work under anybody or under official supervision if he is a good farmer and has ordinary sense

"About ninety percent of what has been said of the failure of land schemes in this state is pure words. A majority of the failures that have occurred was on the part of people who never intended to farm and who, bidding against each other, have put up the price of land above its capacity for profitable production, and have paid too much to speculators who have worked off a lot of unprofitable land on a lot of foolish people, most of whom were not farmers at all . . .

"None of us with any sense of beauty can fail to admire the artistic way in which the Spanish pioneers, under official supervision, laid out their pueblos, their haciendas and their missions . . . These pioneers who preceded the Anglo-Saxons were alright in their way and in their day and generation. But over the civilization of Spain hovered forever the shadow of official supervision and surveillance. And that is why the civilization that existed in California before the Anglo-Saxon came disappeared from the face of the earth, and in its place has come the progressive, aggressive, liberty-loving, energetic Anglo-Saxon people who have taken possession of California. Here they will stay and here they will be supreme so long, and so long only, as they continue the native spirit that has carried them thus far, and that has made them the most restless, resistless, freest and best race of men that has peopled the earth in all the tide of time."

While California land boosters talked glibly of a thirty-million State population within the not distant future, the new Land Settlement Board, led by Dr. Head, plunged into their duties with whole-souled enthusiasm. Besides the original object of betterment of rural living conditions, better land use practices and getting the landless man on to the landless land, that year the board added two other major objectives, which were: (1) That provision was to be made first of all for World War veterans to secure land on the State-subsidized, colonized projects and (2) Work was not to be on a demonstrative basis but was to become permanent State activity, with a ten-million dollar revolving fund set up to establish a series of farm colonies the length and breadth of the State.

The first fly in the ointment of the official colonization plan was the difficulty encountered in securing proper lands at a reasonable price, as the new State land use body became the target of real estate promoters from all parts of California. The original advertisement of the board asking for lands suitable for their colonization venture resulted in offers of land aggregating 199,089 acres, in tracts of 2,000 to 12,000 acres. Only eighteen percent of the offered lands were in any way suitable and even these had drawbacks, so the State re-advertised for bids.

The second canvass resulted in 64 private land owners offering to sell to the State at a good stiff price an aggregate of 515,547 acres. Thirty-two of the tracts, involving 272,680 acres, consisted of dry, rolling uplands, lands saturated with alkali, or poor, shallow soils with underlying hardpan pushing at the roots of their sparse grass cover. Four tracts, embracing a total of 78,400 acres, were frankly arid desert, with no available water. Six parcels of the offered lands covered 26,623 acres of low-lying swamp land from which the reeds and tules had been burned and which the owners could not palm off on even the most innocent of Californic land purchasers. One party even unblushingly offered a tract of 8,000 acres entirely covered with water twice daily when the ocean tides reached their high mark.

Only ten of the tracts offered by would-be sellers, including a total of 52,525 acres, were classed as good farm lands with adequate water rights, and only six of the sixty-four tracts offered for sale could be considered by the colonization board. The board was somewhat discouraged after months of investigating these offers and even the enthusiastic Elwood Mead sounded a rather pessimistic note when he ventured the statement, "Land costs, the need for generous credit, the need for expert advice, are against the business success of colonization."

The board finally closed a deal for 6,240 acres of clay adobe grain lands in Butte county to form the basis of the Durham Colony. The price paid was \$542.847 for the land and an additional \$39,610 for the improvements, thereon, an average cost of \$80.65 per acre.

The State was stung somewhat worse, however, in its acquisition of land in Merced county on which to found the Delhi colony. For 7,987 acres of sandy land the board paid an average price of \$92.50 per acre, altho local realtors conceded that \$30 per acre was its maximum market value. This sandy land, hitherto used for the production of grain crops, had previously rented for fifty cents an acre per annum. Judge C.F. Lett, who sold 2,300 acres of the land through a third party, cleaned up a tidy profit since as a young jurist some half a century previously he had secured the land from a client as a legal fee.

When the Land Settlement Board evinced interest in this area, local land speculators boosted prices. The sellers were really able though, to pose as public philanthropists when a Japanese Colony, bidding against the State, offered \$100 an acre for the same lands. To the purchase price of the land had to be added the cost of bringing water to the colony lands, or \$71.42 more per acre.

The individual holdings of the colony were laid out in country farms of three to thirteen acres and in general farms of a larger size. Laborers' allotments, in tracts up to three acres, for men who would work on their own small holdings part of the year and as hired laborers on other lands the balance of the time, were set aside on the basis of one such allotment to approximately three of the other types of farms. Considerable of a sales campaign was launched by the State and much public interest aroused, with feature articles extolling the venture in such leading national publication as the Saturday Evening Post, Colliers, and the Christian Science Monitor.

On the start, the colonization enterprise was placed on a strictly business basis and one State officer at the Delhi Colony devoted his entire time to the selling of land. Colonists were required to have \$1,500 cash capital out of which they paid five percent of the purchase price of the land and forty percent of the cost of a permanent improvements, the latter including levelling, ditching and piping of the land for irrigation. They were required to secure their loans from the Federal Reserve Bank with interest rates of five and five and half percent. Thirty-seven and half years was allowed the settler to pay for his land and permanent improvements, and five years to repay loans made him for the purchase of livestock and implements.

The major problem on the start was the selling of the land to colonists. Many prospective settlers had the idea that the State was responsible for their success or failure and often balked at finally closing the deal for land purchase when they learned that the role of official California in the venture was merely that of a real estate agent offering unusually liberal terms to would-be California farmers, and acting as the colony's sponsor and advisor. The Durham Colony was fairly successful; the Delhi Colony was almost a rank failure.

Large Land Holdings

California was honestly struggling with her twin problems of large land holdings and her farm labor situation. There was a large relative increase in the number of farms operated by hired managers and tenants between 1910 and 1920. The Federal census stated that in 1919 the percentage of California farms operated by hired managers was 4.2; operated by tenants, 20.6; and operated by owners and part owners, 75.2. In 1910 there were 1,816 Japanese farmers in the State; in 1920 the number had grown to 5,152. During the same decade the number of Chinese farmers dropped from 512 in 1910 to 466 in 1920.

Simon J. Lubin, heading the State Commission on Immigration and Housing, conducted investigations somewhat paralleling that of the commission investigating land colonization except that Lubin's studies tended more towards the human equation in land use. Giving years of his life to the work, he did much for the betterment of conditions for the California farm laborer, and on every possible occasion lashed out bitterly at the State government for its apathy in allowing land use conditions to exist as they were.

Lubin's investigations disclosed that in the extreme southern California counties alone about the close of World War I, fifty-seven individual owners having more than 10,000 acres each, owned a total of 4,040,512 acres of land, 600,000 acres of which was still unpatented. Some 255 large owners held 4,893,915 acres. The Southern Pacific Company was still the largest private landowner in the State, being yet the proprietor of 2,598,775 acres in four of these southern counties, and of 642,246 in one county alone.

The total land area of all types included in farms in these eight southern counties was found to be 4,587,581 acres, and owners of 2,000 acres or more were the proprietors of 2,295,140 acres covered by these farms. The tillable land in the eight counties mainly lying idle at that time was given as 392,110 acres, exclusive of Southern Pacific lands. These large land holdings ranged from 65.7 percent of the total number of farms in Santa Barbara county down to only 9.9 percent in Imperial county.

This Commission on Immigration and Housing bitterly complained that in no case in Southern California among land selling companies, with the exception of the Southern Pacific Company and the Imperial Valley Farm Lands Association, was the ordinary contract of time payment more than four years. Under such payment restrictions, mortgages could be foreclosed and the lands sold over and over again.

Following are brief excerpts from the acidly-worded report presented to the State governor by Lubin's commission towards the end of 1919:

"These selling companies are land merchants, buying and disposing of the commodity, land, and naturally they want a quick turnover of their goods.

"California wants emigrants with money enough, earned somewhere else, to buy land of us, at a higher price than we paid for it.

"The great frauds practiced upon settlers in California form a chapter in the state's history which is an ineradicable disgrace. The spent savings and the toil of thousands of ruined lives have gone to the making of a few fortunes, and for all this deceit and robbery there has been little or no redress. Powerful interests stand determinedly in the way of reform."

Lubin and his official State Commission on Immigration and Housing went on record as strongly favoring assessment of all lands at their actual value and in order that this might be equitably done recommended a State-wide land classification.

Exponents of the single tax plan had for years argued that their form of taxation was the cure-all for the evil represented by the large areas of California's idle lands. Supporters of this form of taxation under which all land would be assessed according to its value for use and occupancy, regardless of whether or not it was being occupied, secured a place for their issue on the ballot on November 7, 1916. The proposal was defeated by the voters 576,533 to 260,332. Appearing on the State ballot again in November 1918, votes numbered 118,088 for the measure and 360,334 against. The Single Taxers tried again on November 2, 1920 when 196,694 voters declared themselves in favor of the single tax system but 563,503 voted against it.

The advocates of the single tax system were persistent and in a somewhat different guise again brought the issue before the citizens of the State on November 7, 1922. Once more it was overwhelmingly defeated, 515,590 voters expressing themselves against the proposal with only 124,403 in favor of the scheme. Regardless of any merits it might possess, at four consecutive State elections California citizens had emphatically said No to the single tax plan as a solution to their idle lands problem.

Japs and Wobblies

Japanese aggression in rural California steadily continued. The ingratiatory servility of the wide-toothed, smiling Jap greatly appealed to the larger landowners. As a nodding, obsequious house servant he left little to be desired, and gradually replaced the more stoical, standby Chinaman. He spread over the gardens of the rich, but worst of all into the fields and orchards, smilingly pushing the white farm laborer and tenant farmer to one side. He was as good a fisherman as he was a gardener or farmer, and Jap toilers of the sea multiplied along California's coastal waters commensurately with their increase in numbers on the California Farms.

It is small wonder that the American farm laborers became a surly, rebellious element, as the clannish Japs more and more usurped

the place in the rural economic structure which belonged to native whites by right of conquest and inheritance. During the first decade of the century, on large ranches where hired managers wrung every possible cent of profit from the lands under their supervision, Japanese laborers, in order to gain a foothold on the land, worked for as low a wage as forty cents a day, without board.

Even the California Fruit Growers Exchange for a time turned to Oriental labor. One of their officials defending this practice said: "The Japs and Chinks just drift - we don't have to look out for them. White laborers with families - if we could get them - would be liabilities." The great California cooperative soon changed its tune, however, and proved itself American to the core when its executives at their 1907 convention declared: "The Chinese when they were here were ideal. They were patient, plodding and uncomplaining in the performance of the most menial service. The Japanese coming in are a tricky and cunning lot who break contracts and become quite independent."

The Asiatic Exclusion League was organized in California in 1905 and immediately set about pressing for action on the California Japanese problem. Legislators of the nation from sections other than the Pacific Coast persistently failed to understand the seriousness of Japanese encroachment in California. The "School-boy Incident" of 1906 whereby Japanese children were barred from Public schools in San Francisco to a certain extent aroused national consciousness to the California problem as the matter developed into an international issue.

Japanese exclusion bills were introduced in Congress in 1907 and 1908 but failed of passage, as official Washington side-stepped the issue for fear that legal restrictions on immigration would strain friendly relations with the Mikado's empire. In place of restrictive legislation there was worked out the so-called "Gentlemen's Agreement" whereby the Japanese government agreed to issue passports to its subjects allowing them to come to the continental United States only if they were nonlaborers, were coming to join their families, or to take possession of previously-acquired land.

This Gentlemen's Agreement was consistently violated and in spite of the efforts of an efficient border patrol, smuggling of Japs into California became part and parcel of the illegal traffic which also brought in many Chinese and other Orientals to labor on California farm lands.

Generally speaking, the nation at large refused to take any view of the far Western Japanese problem other than one of sympathy for

the subjects of the Rising Sun Empire. The tolerance of the national viewpoint was responsible for the picture bride racket by which lonely Japanese bachelors were cheered by the permitted immigration of native Japanese brides who legally joined their husbands in amassing wealth from California's farm lands and in augmenting the Japanese population of the State. This open door to Japanese immigration was not finally closed till early 1920.

The feeling against Japanese encroachment gradually gained ground and strangely enough, the thinly-populated State of Idaho joined California in vigorous efforts to exclude further Japanese immigration. Exclusion bills were fought through Congress in 1912 and 1913 but failed to secure sufficient votes to override President Taft's veto. President Wilson, evidently also afraid of hurting the feelings of official Japan, vetoed another Japanese exclusion bill passed by Congress in 1915. Meanwhile, California in 1913 took drastic action herself by passing the Webb Alien Land Act which prohibited ownership of lands by aliens who could not become citizens, or the leasing of agricultural lands by such a class of people for more than three years.

At this time alien Japanese in California to the number of some 75,000 owned over ten thousand acres of the choicest farm lands and leased over a quarter of a million acres more. The legislation barring foreign-born Japanese from owning land in California bothered them but little. They merely continued to acquire land in the names of their American-born wives or children; then too, there was no legal limit on their short term leasing activities.

Rather incomplete official figures placed the increase in California's Japanese population between 1910 and 1920 at 30,000. While they comprised but two percent of the population of the State, they controlled by ownership or lease what was then classed as eleven percent of the State's best agricultural lands, an estimated area of around half a million acres.

In some of the richest farming districts they owned or leased seventy-five percent of the best lands, including in their scope of farming operations the rice district of Glenn, Colusa and Butte counties; the grape raising and fruit areas of Fresno, Kings and Tulare counties; the vegetable and fruit farms of Los-Angeles and Orange counties; the canteloupe and vegetable districts of the Imperial Valley, and the vegetable, fruit, berry and vineyard sections of the Delta Region. In the last-named area, known as the Holland of America, Shima, the Japanese potato king, planted 20,000 acres of potatoes and virtually controlled the market for this product in California. It is recorded that Shima paid landowners eight million dollars in rent money in twenty years.

Wherever intensive farming methods were followed, there were found the Jap farmers toiling in the sun - male and female. They invaded the nursery field and almost monopolized the cut flower industry. They practically controlled the vegetable industry of the State. With the patience of their kind, they spread out along California's coast gleaning an abundant harvest of the prolific fish crop which had so amazed the Spanish explorers centuries previously. In 1916, out of a total of 2,895 licensed commercial fishermen in California, 491 were Japanese. In 1920, out of a total of 3,966, the Japanese fishermen numbered 1,287.

On November 2, 1920, an initiative measure, still more strict than any previous law against Japanese encroachment, was passed by the voters of the State, three to one. This measure not only prohibited Japanese aliens from owning land or having any interest in any company owning real property, but from leasing land as well. Japan immediately protested and the act was attacked as unconstitutional.

The Japanese usually worked as farm laborers only until by one way or another they could obtain control of a piece of land to work for themselves. Their numbers, however, had a decided effect on white American farm labor, unpopular at the best with the proprietors of big farms. By 1920 heavy importation of Mexican laborers commenced to replace the Japanese, now mainly engaged in working their own lands. In 1920 Filipinos were first employed as farm laborers and that year over 600 came to California. Hindu farm laborers, with their distinguishing headgear, were becoming a familiar sight in the Interior Valley Region. In spite of all the vigilance of the border patrol, a considerable number of Chinese were still being smuggled across the international border.

Rarely were the Oriental laborers seen tramping the country roads. The spectacle of white farm laborers lining the highways was quite a common one. The situation in 1920 was little better than it had been in 1911. That year the Hendrick Congressional Committee, investigating the workings of the gigantic sugar trust, placed John D. Spreckels, the California sugar magnate, on the witness stand. He testified that it was absolutely imperative to have Oriental labor to carry on the sugar beet industry.

One of the investigating committee asked Spreckels what the farm laborers did during periods when they were not working in the beet fields. The California sugar king was somewhat non-plussed and while probing his mind for an answer, California Congressman John E. Baker, himself a member of the investigating committee, answered for him, - "They live in the summer the year around in

California. It is a good country for tramps."

Simon J. Lubin, champion of white farm labor as against such large employers of alien farm labor as Spreckels, officially expressed himself as horrified at the treatment accorded some 75,000 white farm workers investigated. In his report he described their living conditions as "devoid of the accommodations given horses."

It is perhaps little wonder that the Industrial Workers of the World (the I.W.W.), known in local parlance as "wobblies," found a fertile field for their operations and gained considerable strength in California, both in urban and rural districts, between 1910 and 1916.

The I.W.W. was frankly anarchistic in character and an advocate of violence in the matter of labor securing what they deemed its just rights. No doubt the ranks of the wobblies were more or less permeated with the dregs of humanity, - petty thieves and petty criminals - but the most serious charges against the majority of them was that they were mostly direlicts, drunks and nomads, products of an environment which treated them inhumanly while employed and then cast them adrift to starve when their work was completed.

Agricultural labor troubles had been common for twenty years in the citrus belt of the south and throughout the Interior Valley Region. Many of those classed as "wobblies", or "I.W.W.s," but whose worst sin was that they were merely itinerant, hungry farm laborers, were brutally treated by local peace officers, as they were kicked about from one town or community to the other. At times units of the National Guard were called out to quell rioting incited by the relatively small numbers of the true wobblies among the unemployed.

So far as records are available, the official membership of the I.W.W. in California at its peak never reached a figure greater than 5,000 although this was a sufficiently leavening influence to cause serious disturbances among the many thousands forming the army of often unemployed farm workers. Two of the main centers of trouble were Fresno, with its intensive agricultural development and San Diego which by its industrial development, trebled in population between 1910 and 1913.

The average American farm laborer, nomad and outcast though he was, usually could not stomach the revolutionary principles to which the I.W.W.'s subscribed; nevertheless, the wobblies were an organized body, made a lot of noise, and so acted as a sort of magnet around which the unemployed congregated. Newspapers in the areas where the true wobblies and their satellite idle workers gathered did much to inflame public feeling against both classes, since in the public mind the idle transient laborers were tarred with the same brush as the subversive organized element. In San Diego, where local vigilantes flogged wobblies and forced them to kiss the American flag, the San Diego Tribune of March 4, 1912 launched this paragraph against the I.W.W.:

"Hanging is none too good for them and they would be much better dead; for they are entirely useless in human economy; they are the waste material of creation and should be drained off into the sewer of oblivion there to rot in cold obstruction like any other excrement."

One might consider the press of San Diego somewhat anomalous in its attitude if it intended to include the general "down and outer" unemployed laborer in its denunciation of the men who formed the breadlines in that Southern California metropolis, since on January 1, 1914, the San Diego Union declared:

"California has room for 20,000,000 happy, prosperous people. It has room for 100,000 more forty-acre farms, and then there is more room. The farm is the thing. The farm is the basis of all real wealth and happiness. The farm in California is more nearly the ideal place on which to spend a life of usefulness and happiness than can be found elsewhere in the world."

In its denunciation of the I.W.W., we find this same newspaper venting its feelings five days later as follows:

"Their demand should be treated as pure insolence and if they persist in their efforts to make trouble, they should be given terms in a chain gang or at a rock pile. A very little of either will suffice for ridding a city of these fellows."

San Diego, however, even then was really doing something for the betterment of the unemployed transient laborers, even though such men shared a lot of the punishment meted out to their boon companions, the actual wobblies. Going back a considerable ways in the history of this cradle of California, it will be recalled that under the Spanish colonization scheme each pueblo was given a considerable tract of land for the general use of its citizens. This gift of land to San Diego, title to which was upheld by the American Land Commission, originally embraced 48,000 acres.

The city government in the early seventies sold a large portion of these lands along the waterfront for as low a price as 26 cents an acre.

In 1903, the city trustees sold another relatively large tract for a small sum. The purchaser cut it up into building lots which, sold for .5 each, brought him in what was considered a handsome fortune in profits. However, San Diego continued to grow and expand, and purchasers of these five-dollar building lots sold them a few years later for \$100 each. One woman had invested her lifetime savings in 700 of these cheap lots, the sale of which ten years later made her wealthy.

In 1910 the city administrators called a halt on any further sale of city lands and by that time had still 7,000 acres left, located on a tableland approximately ten miles north of the city proper. This land was without irrigation water and for the most part brush-covered except for a grove of Torrey pine - a species of tree, incidentally, which grows naturally no other place on earth.

In the fall of 1910, the city engaged Max Watson, a young technical forester just graduated from the University of Michigan, to manage this wild land. The young forester cleared and planted fifty acres to foot-high eucalyptus trees. Now, San Diego is blessed with what their Chamber of Commerce characterizes as the second most equitable climate in the world, so in spite of the scant ten-inch annual precipitation of that section, a year later the trees of the new municipal forest were eight feet high. San Diegoans were mighty proud of their new land use venture and encouraged the city forester when he projected a nursery of 300,000 trees of different forest and shade species. Watson, noting the long lines of men being fed - and often jailed - at the city's expense, asked for a gang of the jobless men to work on a combination forest and farm on this land.

The hard-boiled city police sized up the slender figure of the young forester and snickered. "Why, those husky bums would murder you," they predicted, and the human direlicts in the city's bread lines looked perfectly capable of committing mayhem. Watson was persistent, however, and the city authorities furnished him all the man-power he needed. Within a short time a prosperous tree nursery and farm was established, agricultural crops being grown during the rainy season, trees the year around. The itinerant laborers were paid fifty-cents a day, furnished with good board, lodging and sanitary conveniences. Besides setting out 40,000 seedlings the first year, these indigent laborers chalked up to their credit 225 tons of hay which they raised to feed the city departments' horses, and a big crop of peas, beans, tomatoes and other farm products.

The demand for work on the municipal project by the down and out laborers became so great that the bulk of the employees were replaced every ten days by new squads of workers. Hundreds of men from the bread lines and soup kitchens of San Diego regained a measure of their self respect and a small financial competence. The venture cost the city \$9,000 a year which was more than repaid by the growing timber and farm crops, to say nothing of the big saving also in the lessening of crime and police effort. City water was eventually piped to the farm-forest to increase both its production and its human rehabilitation possibilities. The project was abandoned in 1916 when world war conditions relieved the unemployment situation.

America was pretty well used to bloody riots and strikes among city workers but that spontaneous outbreak of suffering farm labor, known as the Wheatland Hop Riot, was a different type of labor war, and showed also the bloody hand of the I.W.W., permeating labor ranks in the rural sections of the State.

On August 3, 1913, some 2,800 hop pickers were camped in the hot sun near the Durst Ranch in Yuba county. Fifteen hundred of the number were women and children, and it was later disclosed that approximately 100 actual wobblies were numbered among the male workers. The thermometer stood at 105 in the shade, there was insufficient water for camp use, and no water whatever in the fields. There was no sanitation, no provision made for garbage disposal, and many of the campers were ill with nausea and dysentery.

About one-third of the hop harvesters were native Californians, mainly from urban centers, the balance transient farm workers of the usual type. Children engaged in the work of hop picking with their elders, and individual earnings ran from seventy-eight cents to one dollar a day per person, for twelve hours work in the boiling sun. Famished for water, workers in the fields were forced to buy lemonade at five cents a glass if they would quench their thirst, and a cousin of the ranch owner Durst, had a monopoly on this lemonade business.

Although, conditions were almost beyond human endurance and presented just such an opportunity as the anarchistic wobblies had been seeking, to strengthen their hold on rural farm labor. An I.W.W. local was organized in the camp and some thirty new members took the oath of membership. The moving spirits among the suffering workers were Blackie Ford and a man named Suhr, both leaders in the I.W.W. organization.

At a mass meeting protesting working conditions, Blackie Ford openly advocated violence and the Durst interests, becoming alarmed, sent for police help. Peace officers arriving on the scene sought to disperse the milling crowd of excited people. One of them in an attempt to restore order, fired his pistol in the air, and the fight between the peace officers and the workers was on. In the wild melee that ensued, the district attorney, a deputy sheriff and two workers were killed, and many persons injured. A detachment of the National Guard, hastily mobilized, finally restored order and took possession of the camp.

Over a hundred workers were arrested. Ford and Shur, later convicted of murder, were sentenced to life imprisonment, altho it was proven that Suhr was not actually present at the riot.

The blame for this disgraceful and tragic incident can probably be laid as much at the door of the ranch owners as upon the shoulders of the I.W.W. Nevertheless, conditions surrounding these workers represented a fair sample of those prevalent in rural California generally. Altho the Wheatland riot raised a storm of indignant protest throughout the State against the I.W.W., it had little effect on any betterment of the virtual peonage labor system existing in rural California, other than letting the populace know that such conditions did actually exist.

With the outbreak of World War No. 1 and the resultant betterment of labor conditions generally, the stock of the wobblies declined considerably in the rural sections of the State. Members of the organization were justly suspected of subversive activities and during 1917 were arrested by the hundreds throughout California and in other parts of the nation.

Farm labor was decidedly short during those war years of 1917-18. Somewhat as during the present world conflict, a women's land army, youth from reform schools, and organized groups of both boys and girls went forth into the California fields to assist in harvesting operations. The big growers greatly profited by the war which not only boosted prices but resulted also in the setting of a general established wage for these volunteer farm workers of 25 cents an hour. The workers themselves were supposed to get a least a part of their remuneration from the realization that they were doing their bit for their country, the exploiters of their toil pocketing the difference in the accruing profits.

The independent small farmer also prospered by virtue of increased war prices for farm products. During the decade ending 1920 living conditions for the small freeholder in California had greatly improved. That year the Federal census showed that California farmers owned 71,518 automobiles, 6,416 trucks and 13,852 tractors. A total of 30,519, or 25.9 percent, of the State's farms had gas or electric light, as against seven percent for all the farms of the nation.

In the entire United States, ten percent of all the farms had running water piped into the farmhouse; in California, fifty-six percent, or 65,928 farms, enjoyed this domestic comfort. While the entire country generally showed 38.7 percent of all farms equipped with telephones, California lagged behind in the possession of this utility which the census showed existed on 37,309, or 31.7 percent of the State's farms.

Thousands of Californians, returning from the battlefields of France, doffed their uniforms and put into effect some of the lessons learned from the frugal French peasant farmers who had taught them new concepts of land use while at the same time had instilled in their minds a greater appreciation of the potentialities of California land production, combined with a high-standard of living undreamed of among European agriculturists.

These veterans had witnessed the deep attachment of the French farmer to the land which generations of his forbears had carefully tended. They had learned that after centuries of intensive use of those older lands, even though torn by the ravages of war, the Good Earth, properly treated, still produced in abundance and to some extent put to shame the lavish use of land in the newer commonwealth.

Golden Gate Park

While not "rural California," and part and parcel of one of California's most intensively-used urban areas, as illustrating the possibilities of California land and in response to intelligent use, the history of the 1906-1920 period of California land use might well conclude with mention of the great Golden Gate Park of San Francisco.

This city park lies in the heart of the metropolitan area, embracing 1,049 acres. With a half mile frontage along the Pacific Ocean it extends back into the city environs for a distance of three miles. Virtually every square rod of this magnificent park is covered with a profusion of growth not native to the land which it embraces.

Reverting again to Spanish Days, San Francisco, (Yerba Buena) in common with the other pueblos and presidial towns of California, was given a liberal gift of land. In 1868, squatters were scattered over this desolate sand dune area of over a thousand acres and the pressure of population growth was demanding its development for business and residential purposes. The city government instead carefully surveyed the tract and wisely dedicated it to future public uses. This land even at that time, due to its location, was officially valued at \$801,593. The forbidding-appearing area was then known by the prosaic name of Main Park.

John McLaren, a Scotch botanist and gardener, was placed in charge of this public land in 1887 and to his vision and lifetime of work, San Francisco owes the distinction of having one of the finest large city parks of the world. Wells were drilled a few rods back from the shoreline and adequate artesian water was thereby made available to apply to the sandy wastes. Day after day, and month
after month,

McLaren badgered city officials for any funds or help which might be made available for his beloved project. All the manure from the city's stables was hauled to the area. A chain of artificial lakes was built and water systems cunningly concealed beneath the introduced plant growth. In a few years the area was covered with groves of trees, shrubs and plant growth and by the combination of water and fertilizer, McLaren made the veritable desert blossom as the rose.

Miles of paved roads, bridle paths and foot paths now traverse the park. Giant eucalyptus, elms, birches, bamboo groves and towering coniferous trees, looking down on myriads of shrubs, flowers and velvety lawns, justify the faith of its creator in this segment of originally waste California land.

There are over 4,000 species of fauna in Golden Gate Park, all introduced, yet the area has very little the appearance of an artificial creation. Except for the fine buildings and beautiful statuary with which proud Californians have adorned this man-made Eden, one could easily imagine the area to be a virgin wilderness. No glaring billboards or hot dog stands to mar its rustic charms and yet no "Keep of the Grass" signs, the area retains its striking beauty in the face of constant use by many thousands of people.

Standing shoulder to shoulder with Luther Burbank in demonstrating the possibilities of California land, John McLaren, disdaining all offers of wealth, honor or glory, spent over half a century in building for the use of posterity this magnificent monument to his own memory, and the world will long continue to beat a path to his former cottage, to witness the surrounding wonder which his foresight and industry created.

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